KPMG Peat Marwick

A Study

To Assess the Impact of a "Pay the Producer" Method of Payment upon Alberta's Food Processing Industry

Final Report

Peat Marwick Consulting Group
Edmonton, Alberta

October, 1989

90-02293/

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EXECUTIVE SUMMARY

Background/Objectives

Alberta Agriculture and the Alberta Department of Economic Development and Trade commissioned this study to assess the impact that a change in the method of payment of the Crow Benefit would have upon Alberta's food processing industry. The method of payment change examined is that of a "pay-the-producer" approach. It has generally been perceived that the current method of payment under the Western Grain Transportation Act works to the disadvantage of Alberta's food processing industries by inhibiting opportunities and constraining the ability to access export markets.

The primary objective of this study was:

To determine the impact which a change in the method of payment would have upon Alberta's Food Processors and Manufacturers.

Additional objectives, as outlined in the Terms of Reference, were:

To develop interest in the method of payment issue; and,

To increase awareness and facilitate understanding of the issue.

Approach

Impact on several processing chains was determined by an estimation of the expected change in price based on the difference between the 'pay-the-producer' and 'pay-the-railroad' alternatives. This difference will initially be the change in the freight rate, or more precisely, the federal government share of the Western Grain Transportation rate. Government subsidy per tonne was forecast using a provincial government annual rate forecasting model. The projected impact on grain price was $19.46/tonne.

The following agri-food processing "chains" were selected for analysis:

- Wheat chain
- Canola chain
- Meat chain
- Supply managed chain
- Course grains/feed products
- Milling and malting barley
- Peas, and beans chain

Price scenarios were presented to processing businesses to estimate impact on behaviour, activities and performance. Business managers were requested to comment on perceived implications of impact on volume, domestic and export sales, profitability, employment and investment. Our approach concentrated on the impacts at the firm level and extrapolated this information to estimate impact on the industry. Strict assumptions were imposed concerning the projection of the effects of changes in the cost of input in relation to changes in the price of corresponding outputs. Several of these assumptions included:

- the mechanism for pay the producer will pay the entirety of the Crow benefit to the producer and no phase-in period will be implemented.

- analysis did not take into account any other developments in grain transportation pricing policy.

- benefits were assumed to flow through the chain to the end product, except for the meat packing and supply managed sector analysis.

- other variables such as exchange rates, interest rates, trade barriers, regulatory factors, and capacity utilization were held constant in the initial analysis.

- analysis was based on a static approach and did not provide for growth in the industry or take into account producer surpluses.

Summary of Findings

The following potential magnitude of agricultural processing impacts associated with method of payment reform were identified for seven distinct processing chains:

Wheat

Incremental cost savings on flour were estimated to be $27.03/tonne, or $6.59 million to the cereal milling industry. Under the assumption of transfer of full benefits to the bakery and pasta industry, estimated impact of reduced flour input costs are predicted to be $4.06 million and $.24 million, respectively.

Canola

The Canola processing chain was very positively disposed to a pay the producer approach. Anticipated impact on the Canola crushing industry was $5.95 million. Under assumptions of full benefit transfer, the Canola meal and refining industries were estimated to receive incremental savings of $1.54 million and $4.41 million, respectively.

Livestock

Two scenarios were used in the calculation of impact of a change of the method of payment to the beef cattle, swine and sheep industries: one under the assumption of discontinuance of the Alberta Crow Benefit Offset Program (ACBOP); and, one scenario under the assumption of continuance of ACBOP. Industry estimates of impact under the first scenario were $20.6 million to the beef cattle industry, $10 million to the swine industry, and $.37 million to the sheep industry. At current production levels, estimated savings accruing to the beef, swine and sheep production sectors under the second scenario are $10 million, $4.88 million, and $.18 million, respectively.

Meat Packer/Processor

Since Alberta production represents a small proportion of the total North American market, no anticipated changes in livestock prices are expected to occur as a consequence of increased local supply. Therefore, analysis of impact to the meat packing industry was based on forecast profit savings resulting from livestock supply increases of 15%, 20%, 25% and 30%. Profit/volume relationships were used to estimate impact to the beef packing industry. Incremental net income changes ranged from $1535 per shift to $3068 per shift.

Supply Managed

Within the dairy industry, impact on the fluid and industrial milk production sector was estimated to be $2.16 million and $2.62 million, respectively. Due to the structure of the marketing system, savings in fluid milk production are anticipated to be eventually passed directly to the consumer. Potential impact to the egg, chicken and turkey industries were estimated to be $.68 million, $1.14 million and $.32 million, respectively. Savings resulting from reductions in feed costs were anticipated to remain in

the hands of commercial egg producers, but were anticipated to be shared between producers and processors in the poultry meat industries.

Feed Industry

Estimated incremental savings to the feed industry were calculated based on type of ration. Feed mills tend to charge a flat rate for the milling process and were viewed as being highly competitive. Due to anticipated growth in the livestock sector, demand for processed feed is expected to increase.

Malt/Brewing/Distilling

Savings to the malt industry have been estimated to be $1.5 million. Under the assumption of full transfer of benefit, impact to Alberta brewers was anticipated to be approximately $.4 million. It was estimated that the distilling industry could potentially realize a benefit of $.117 million in the production of vodka, and $.11 million in the production of whiskey.

Bean/Pea

Estimated impact to the dried bean and pea industries was $8.3 thousand and $651.7 thousand, respectively. Due to the large exports of dried beans and limited domestic demand, little impact to the dried bean industry was predicted.

Further Considerations

Industry specific considerations and opportunities for investment and growth were identified for each of the seven chains. Where possible, constraints to development of domestic and export markets were also identified.

Other issues determined to be of significance to the processing industry included:

- the relatively infant state of development of the Alberta food industry;
- the location of Canadian processing plants near larger population bases;
- opportunities for development of southern U.S. and Pacific Rim markets;
- the accuracy of government share of transportation cost estimates based upon future inflation rates and present cost sharing formula;

- the advantages of increased access to U.S. markets as a result of the Free Trade Agreement; and,

- rationalization of the transportation system.

Conclusions

Economic theory suggests that a pay the producer approach to the Crow Benefit should have positive impacts on Alberta's livestock and value added processing industries. The economic impacts will be both short term and long term in nature. Short term impacts may include improved financial performance and consumer benefits resulting from a lower cost structure. Over the longer term, changes in regional comparative advantage should affect investment decisions with consequent plant establishment and expansion and increased processing volume and employment in the province.

There is some evidence that senior managers in many firms have not yet commenced a thorough business analysis of the implications of method of payment. When such analysis is undertaken it will no doubt confirm the predictions of economic theory particularly when long term implications are considered. For the most part, impacts will not be immediate and dramatic for agricultural processing. However, over time, the economic environment created by pay the producer will be more conductive to sound investment decisions and more acceptable levels of profitability.

Our investigations indicate that, by and large, predictions based on economic theory will be borne out in practice. The processing industry is positively inclined toward the reform of Crow benefit payments. Alberta's livestock industries are anticipated to receive the greatest benefits from a method of payment reform. More acceptable levels of profitability and increased processing volume and employment in the province are anticipated.

I. INTRODUCTION

Background

For several years various groups have been studying and debating the merits of various methods of paying the so-called "Crow Benefit" provided by the Western Grain Transportation Act. Some of the significant historical events leading up to the present system are outlined in Appendix I of this report.

In anticipation of a renewed debate on the merits of various methods of paying the Crow benefit, Alberta Agriculture and the Department of Economic Development and Trade have commissioned this study to assess the impact that a "pay the producer" policy would have upon Alberta's food processing industry. This review is motivated by the concern that the present system, whereby the subsidy is paid directly to the railways, creates an economic disadvantage to Alberta based processors. One widely-held view is that if the subsidy was paid directly to the producer instead of to the railways, Alberta agri-food processors could buy locally produced grain inputs and other inputs incorporating grain products at a reduced price because the producer would have already received some compensation, in the form of the freight subsidy payment. This would change the competitive relationships between Alberta food processors and those located in regions outside the prairie provinces.

Objectives of the Study

In conducting this study, we have attempted to quantify the impact which a change in the method of payment would have upon various sectors within the major commodity groups. The following "chains" were selected for review:

- Wheat chain
- Canola chain
- Meat chain
- Supply managed chain
- Course grains/feed products
- Milling and malting barley
- Peas, beans and other pulse crops

It is clear that the impact which a change in the method of payment would have upon the various components of Alberta's food processing industry cannot be determined in isolation. There are many inter-related factors which affect these industries. Accordingly, in carrying out this study we have attempted to identify as many of these factors as possible, and highlight them in Chapter III.

The specific objectives of this project are:

- To determine the impact which a change in the method of payment would have upon Alberta's Food Processors and Manufacturers;
- To develop interest in the method of payment issues; and
- To increase awareness and facilitate understanding of the issue and its implications for agri-processing firms.

Accordingly, it is anticipated that this report, or some synopsis thereof, will be used as a "working paper" outlining the opportunities and assessing the impacts, in a format suitable for distribution to interested parties.

Method of Payment Reform

The method of payment has implications for further processing of agricultural products, diversification of Alberta's economy and the further rationalization of the grain handling and transportation systems in Alberta and throughout the prairie region.

With the possible exception of energy resource policies, no economic issue in Alberta has received as much analysis and debate as grain freight rates over the last 15 years. Four major commissions and reviews have addressed, in whole or in part, the Crows Nest Pass freight rates. Each of these exercises generated scores of position papers from interested groups, technical analyses and hundreds of media reports. The historical developments and method of payment proposals are discussed in Appendix 1 of this report.

All of these studies addressed the economic problems created first by the 1898 fixing of the grain freight rate and later by the "pay the railway" approach embodied in the Western Grain Transportation Act. There is a broad consensus among economists and technical analysts that the pay the railway approach constitutes a significant constraint to economic diversification in western Canada. Pay the railways also blunts the

incentive to rationalize and improve the efficiency of the western grain handling and transportation system.

The analysis of these twin issues leaves very little doubt as to the direction of economic impacts. However, there is and undoubtedly will continue to be considerable debate as to the magnitude of the economic impacts. In terms of the direction of impacts, the analysis is straightforward. For example, the current WGTA rate to move barley from Edmonton to Vancouver is $27.31/tonne. Of this amount, the producer's share is $8.11/tonne while the federal government's share is $19.20/tonne. No federal transportation subsidy is available for grain moved to markets within the Canadian Wheat Board designated area. While there are small feed freight assistance payments available on movements of Alberta barley into B.C. interior markets, there is no question that subsidies send a dominant message to export rather than consume grain locally.

If, on the other hand, the producer was required to pay the entire cost of freight regardless of ultimate destination, there would be substantially less incentive to export. Feed grain prices in the Edmonton area would drop substantially, at the outside limit by as much as $19.20/tonne. Depending on assumptions about elasticity of demand and supply, the actual decrease in interior grain prices could well be less than $19.20/tonne. There is little question, however, that the price decline would be substantial in relation to both the absolute value of the commodity and to the processor's margin on operations.

The elimination of the policy-based distortion favouring exports rather than domestic use will, it is argued, result in the following benefits:

- livestock producers will enjoy lower feed costs - a benefit both in an absolute sense and in a comparative sense because the lower cost of gain impacts will not be enjoyed by competitors in other regions of North America;

- many producers could benefit from using their resources in ways different than they are now used with positive implications as a result of: better market information, enhanced production choices and, consequently, more stability of farm net incomes;

- a larger and more diverse agricultural processing industry based on a larger livestock sector and lower priced inputs to grain and oilseeds processing;

- other benefits including better soil conservation practices and a more mature agricultural service industry including local grain trucking;

- economic benefits for the western regional economy through higher agricultural net incomes and a more diversified and stable income base;

- full costs for grain transportation by rail will end the discrimination between modes caused by the current subsidy and will lead to pressures for lower unit cost methods of moving grain from point of production to point of use, including export grain terminals.

Grain Pricing

Over the course of Canadian grain marketing history, several marketing systems have been tried but only two have survived the test of time: the open market system; and, the Canadian Wheat Board system. The open market system supports a competitive environment and visible price determination, whereas the Board, as a monopoly seller, is designed to provide: enhanced selling powers, increased equity through price pooling; and, a mechanism to conclude sales agreements with government buyers and large organizations in export markets. Although these basic differences in function exist , the systems are complementary to each other in their efforts to provide a total marketing operation. They function separately due to the advantages each can provide in either marketing situation. Descriptions of the two marketing systems and the role of government in grain pricing are included in Appendix 2.

Advocates of the 'Pay the Producer' alternative maintain that this approach will result in retention of all or a large portion of Crow benefit on Prairie farms. At the same time, disincentives to both value-added processing and grain transportation efficiency and cost effectiveness improvement may be removed. Although Alberta has the least extensive rail system in the prairies, the averaging of rail costs results in benefits not being realized by Alberta producers. Producer freight rates under the current WGTA are also criticized for not reflecting the direction of grain flows. The freight rate distortions are pooled for all western grain producers, resulting in increased costs to the CWB and the federal government. If producers pay the transportation charges, it is suggested that the result would reflect the direction of the shipments and location of producers relative to the export market.

The essence of the pay-the-producer alternative is that prices of grain in the Prairies are determined by export terminal prices (ie: Vancouver) less transportation and handling costs to get the grain to that point. Quantitative differences between current primary elevator prices and the anticipated prices as a result of the change in the method of payment will initially be the change in freight rate or, more precisely, the government share of the WGTA rate. Realizing that this simplistic approach does not account for supply and demand conditions, some premiums and discounts would result. It is the intersection of market supply and demand curves that determine the product price. If demand exceeds supply, price is hypothesized to rise to ration available supply and stimulate increased production, conversely, if supply exceeds demand, price falls to encourage usage. Livestock populations, weather conditions, embargoes or strikes, and interest rates may affect supply and demand. Supply and demand may differ by type of grain and season (ie: higher demand for feed grain during winter). Supply of grain is influenced by producer delivery patterns,which are generally higher in fall even though consumption of grain is fairly constant throughout the year. These factors, along with general economic factors such as interest rates, exchange rates, trade and marketing opportunities, all affect price levels.

If railways collect the full amount of the freight tariff from the producer, domestic grains can then be predicted to be priced lower (export price minus freight and elevation charges). Benefits should accrue to domestic grain users such as the livestock feeding industry and food processing sectors. The full government share of freight is perceived to be the maximum possible price adjustment. Since prices are a function of supply and demand conditions, the actual price change as a consequence of change of method of payment is likely to differ from that of the government share. The full difference or government share will not likely be realized. One study developed a relationship between CWB payments and stock use ratios to determine barley prices[1]. From this regression equation it may be determined that a change resulting from a pay the producer approach would contribute to approximately 88% of the actual price determination. This estimate is relatively high in comparison to other estimates[2].

The basis[3] is only one of several factors influencing grain prices at the farm gate. Other factors to be considered include local demand/supply, CWB quotas and CWB grain pricing policies. These factors have

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1 Lakeside Research and L.A. Malmberg. An Analysis of the Impact of the Alberta Feed Grain Market Adjustment Program. Part one. June 16, 1986.

2 Arcus Consulting Limited. *An Analysis of Alternative Methods of Paying the Government Commitment To the Costs of Grain Transportation by Rail Under the Western Grain Transportation Act.* A Study for the Canadian Co-operative Wheat Producers. January, 1985.

3 Basis in this context is defined as the difference between the two price series; street price at elevator point and the price at the terminal shipment point, usually Vancouver.

historically influenced both supply and demand for domestic grains. Variability in local demand is of concern, especially if it differs from that of export demand. Differences in variability could result in market inversions in the basis; that is, the basis in future months could be smaller than in nearby months. Although CWB quotas were designed to ensure access to the market and to regulate trade flows, inefficiencies and inadequacies in capacity (issues of rail rate regulation, configuration of rail lines, mis-shipments, and sporatic shortage of capacity) have been reported.

Several studies[4] provide estimates of demand and supply elasticity which support the premise that the elasticities of demand for most grains are more elastic than the elasticities of supply ($\pi_d > \pi_s$). In keeping with Cobweb models, disturbances of market equilibrium in these markets are corrected within a few production periods. In markets where supply elasticities are more elastic than demand ($\pi_s > \pi_d$), supplies are highly sensitive to price changes and price disturbances create highly unstable markets. Thus, in the Alberta feed grain market, the price disturbance resulting from the change in payment of benefits will result in a relatively stable new equilibrium price.

In competitive industries, decreases in input costs shift the average total costs, average variable costs, marginal costs and supply of the product. Each output can be produced with less expenditure on the variable inputs. The cost of each output will therefore be lower. Demand for the input will be derived from demand for the output or product. In competitive markets, prices of the product are determined by the intersection of supply and demand curves, but optimal levels of production depend upon the ratio of input price to product price. If the price of the input (grain) falls, price of the product must fall by the same percentage if optimal level of production is to be maintained.

Our approach attempts to bring together the perceptions of agri-food operators' revenue and cost expectations for individual business with the demand and supply for the market to determine market price and output of the firm and industry. Standard costs of firms provide the building blocks for a budgeting system. This system will indicate the units produced, direct-material costs, and direct labor costs. Individual processors within selected processing chains were approached for this information. In order to maintain confidentiality, only percentages in relation to total sales will be published. Impact on the processing chain will be determined by an expectation of price change based on the difference between the 'pay-the-producer' and 'pay-the-railroad' alternatives. This difference is calculated

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4 Arcus Consulting Limited. *Ibid..: Agriculture Canada (1980) Demand Elasticity Estimates..; and* Dunlop, Diane. *The Impact of Grain Price Pooling on Producer Returns and System Costs.* Unpublished Thesis, University of Alberta. Spring 1989..

as the forecast government subsidy/tonne for a 10 year period to 1998/99 using the WGTA annual rate setting mechanism[5]. This mechanism incorporates volume related and line related variable costs, as well as fixed overhead costs. 95% confidence intervals were constructed around the predicted government subsidy/tonne at the 5 year forecast for the 1993/1994 period based on the variance over the prior 10 year period. These three new estimates (upper, lower bounds at the 95% interval, as well as the actual estimate) form the input change variables for the pricing scenarios used in the impact analysis. The following table represents the forecast government subsidy/tonne as predicted by the WGTA rate setting mechanism:

TABLE 1

PROJECTION OF GRAIN PRICE IMPACT OF METHOD OF PAYMENT CHANGE

YEAR	Government Share in $/tonne	
88/89	21.93	
89/90	21.35	
90/91	20.74	
91/92	20.31	
92/93	19.89	
93/94	19.46*	Confidence Bounds=18.49 to 20.43
94/95	19.08	
95/96	18.67	
96/97	18.26	
97/98	17.86	
98/99	17.52*	Confidence Bounds=16.53 to 18.51

The above prices represent the Alberta average predicted government share of rail freight rates. These forecasted rates will form the basis for the increase in shipper cost. Since these prices are averaged for all of Alberta, there will, in fact, be some regional variations. The 5 year forecast price savings of $19.46/tonne and the confidence bounds around it are conservative estimates of price effects from a change in the method of payment. They represent 84% to 91% of the current government share of grain freight rates. Such estimates are in keeping with economic theory and result from previous studies which suggest that several supply and demand determining factors (not only basis) will influence grain prices.

5 The results from this model were obtained from Economic Development and Trade, Transportation Services, and employed under the consultation of Mr. Clifford N. Weber and Mr. Ray Bassett.

Impact Analysis Assumptions

For the purposes of this study, given its focus on agricultural processing issues, it is assumed that the government will pay the entire Crow Benefit to the producer. Full implementation of the approach is also assumed; that is, it is assumed that there is no phased-in period in moving from pay the railway to pay the producer. It is assumed that the "Grain Transportation Refund" and the "pay-out" approaches, which appear to be the leading contenders in terms of the mechanism, result in essentially the same impact on grain prices in Alberta. It is of course possible, that method of payment reform could take other forms. Alternatives to phase in a pay the producer approach have been mentioned in media reports. Given the basic goals of the study, it was felt that a "pure" pay the producer approach should be utilized as the base scenario.

Finally, the analysis in this study does not take into account any other possible developments in grain transportation pricing policy. The most significant of these potential developments would be a shift from distance-based to cost-based grain freight pricing. Presumably, this change would rebalance grain freight rates in western Canada, with west-bound grain subject to higher costs to move grain to export positions. This is because there are relatively higher costs to move grain through the mountains compared to hauling grain to Thunder Bay. This cost-based grain transportation pricing may change competitive relationships of farm gate prices in the prairies with the possibility of additional, but relatively minor, advantages for Alberta processors of grain or grain-based products.

The price scenarios identified in the previous section were presented to a range of agricultural processing businesses in Alberta. The objective of this step in the analysis was to establish impacts on the behavior, activities and performance of business firms utilizing Alberta grain, oilseed and special crop products in their processing operations. Strict assumptions will be imposed concerning the projection of the effects of changes in the cost of input in relation to changes in the price of corresponding outputs. **The analysis examines these effects assuming benefits flow through the chain to the end product.** This type of analysis has been applied to each product chain with the exception of the meat chain. The unique economic conditions surrounding the meat industry warrant a slightly different analysis, one which establishes profit-volume relationships. Although the assumptions used in this study are restrictive, they provide a measure of potential magnitude of impact. Constraints and inhibitors to the approach which may limit full realization of benefits are identified.

To organize the analysis, seven distinct processing chains have been defined. Alberta processing operations have been identified at each stage of the processing chain. Information was presented to business managers in selected firms on grain price scenarios and other changes related to method of payment reform such as the shift to compensatory rates for movement of byproducts to shipping point. The analysts then worked through a series of questions designed to understand the implications of the price scenarios in the following areas:

1) impacts on the volume of processing activities;
2) impacts on domestic and export sales of product at each stage in the processing chain;
3) impacts on the profitability and financial performance of the firm;
4) impacts on employment levels at each stage in the processing chain; and
5) impacts on investment at each stage in the processing chain.

Given the hypothetical nature of the grain and oilseed pricing scenarios and the practical, operations-oriented perspective of business managers, it is not surprising that it has been difficult to estimate impacts in all of the above areas with a high level of confidence. There are many variables beyond changes in the price of grain inputs which can affect a firm's decisions. Exchange rate fluctuations, interest rate changes, trade barriers, regulatory changes and varying rates of capacity utilization are but a few examples. However, the analysis has been successful in determining the potential magnitude of agricultural processing impacts associated with method of payment reform.

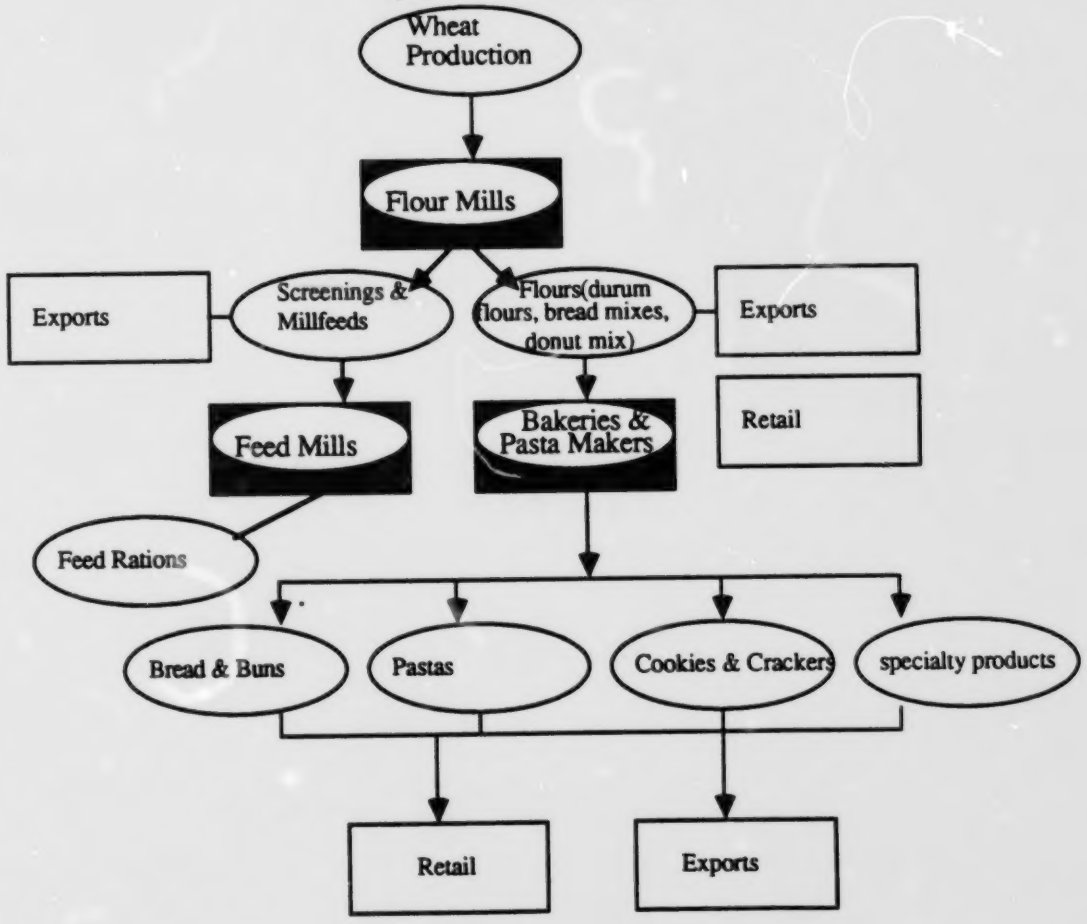
Although, 95% confidence bounds of $18.49/tonne to $20.43/tonne have been constructed around the forecast price savings, for simplicity, the average value of $19.46/tonne will be used in further analysis.

II. Wheat Processing Chain

2.1 Processing Components and Products

The wheat processing chain in Alberta consists of the elements and products identified in Figure 1. The system described in Figure 1 is a simplified representation of the actual processing chain, in that it contains only major processing operations and broad product categories.

Figure 1: Wheat Chain



A technical description of each element and product has been included in Appendix 3: Element and Product Identification of Processing Chains.

2.2 Impact Analysis

The impact analysis for the wheat chain was, by necessity, composed of varied assessments of impacts for small and large firms, and for various product lines. Whenever possible, differential impacts on firms are mentioned specifically.

Flour Milling:

Industry spokesmen confirmed that yield of wheat from flour is approximately 72%. A wheat price savings of $19.46/tonne would therefore translate to a $27.03/tonne savings in flour cost ($19.46/tonne ÷ 72% yield on wheat). Table II.1 illustrates the potential cost savings to the flour industry.

Table II.1
Estimated Impact on Flour Cost

	Standard Baking Flour	Durum/Semolina
Input price savings ($/t)	$19.46	$19.46
yield of input/product (%)	72%	72%
flour cost savings ($/t)	$27.03	$27.03
Incremental flour cost savings (%)*	5.65%	4.89%
Estimated Industry Impact **	**$6.59 million**	

Calculations are based on the assumption that full benefit flow to final product.

*** Based on current prices for standard baking flour and durum/semolina flour of $478/tonne and $553/tonne, respectively.**

**** Based Statistics Canada estimate of wheat flour production of 243,877 tonnes for 1986.**

Baking and Pasta Processing:

It was estimated that flour costs represented approximated 57% of total sales in the baking industry. In the dry pasta industry, ingredient cost represents approximately 36% of sales, and flour is estimated to constitute 85% of the ingredient cost. The anticipated cost reduction in pasta is estimated to be $8.27/tonne ($27.03/tonne decrease in flour cost x 85% of ingredient cost x 36% of ingredients as a % of sales). This reduction in flour cost is estimated to result in an approximate 3¢/loaf of bread cost saving, a 3¢ to 3.5¢/dozen buns cost saving, and a 41¢/20 kg package of pasta cost saving. Estimated incremental price reductions to bakery and pasta goods are represented in Table II.2.

Table II.2
Estimated Incremental Impact to Bakery and Pasta Goods

	Bakery Goods (Bread, Buns)	Dry Pasta
Input price Savings ($/t)	$27.03	$27.03
x input cost/sales (%)	57%	30.6%
= savings in final product ($/t)	$15.41	$8.27
Incremental savings*	$.028/loaf, $.033/doz.buns	$.41/20 kg
Estimated Industry savings($ millions)	**$4.06**	**$.24**

Calculations are based on the assumption that full benefits flow to final product.
* Prices for bread and buns ranged from $.70/loaf to $1.05/loaf and $.90/dozen buns to $1.15/dozen buns, respectively. Average price of dry pasta was quoted at $12.50/20lb. package or $27.5/20 kg. package.
** Estimated industry savings are calculated as a percentage of Value of Shipments estimates for 1988.

Summary:

The potential incremental savings to the wheat processing industry resulting from a change in method of payment are outlined in Table II.3.

Table II.3
Summary of Estimated Incremental Savings to the Wheat Processing Industry

	Cereal Milling	Bakery	Pasta
Value of Shipments (million)	----	$126**	$16**
Total production	243,877 tonnes	---	---
Estimated Savings ($ million)	$6.59	$4.06	$.24

Calculations are based on the assumption that full benefits flow to final product.
** 1988 Estimates of Value of Shipments for Alberta.

2.3 Further Considerations and Opportunities

In addition to artificially high cereal input costs because of the current method of payment, there are numerous other constraints to investment in the industry. In general, the cereal grain milling industry and associated processing and manufacturing firms do not foresee major impacts as a result

of method of payment changes. There do not appear to be any major negatives associated with a pay the producer approach, but on the basis of limited sampling within the industry, the opportunities appear to be relatively modest. In relatively specialized market niches such as oat milling or cracker manufacturing this generalization may not be accurate but the study design by its nature produces a highly aggregated picture.

The following constraints were identified:

- There is declining export trade in flour as a result of export subsidies employed primarily by the EEC and also by the U.S. In addition, importing countries such as Cuba, which has been Canada's leading customer, have added milling capacity.

- The domestic market for wheat flour is not a growth market and, while specialty flours markets and markets for products like frozen doughs have expanded, there is, as yet, not sufficient economic reason to invest in new plants. There are however, economic pressures to invest in technology (eg. automation) which can reduce operating costs and maintain high quality standards for the product and in the work environment.

- The threat of U.S. flour exports to Canada is not imminent and as long as U.S. Producer Subsidy Equivalents for wheat are higher in the U.S. than in Canada no major threat will develop. In the longer term, it is the perception of Canadian millers and end product manufacturers that the U.S. industry is significantly more efficient and that, even with a substantial advantage as a result of the exchange rate, the Canadian industry may not be competitive. Currently, there are U.S. bakery products entering Southern British Columbia, Southern Alberta and Southern Manitoba. One respondent cautioned that U.S. bakeries have advantages in many areas including flour costs, labour costs and shortening costs so they will remain a strongly competitive.

- In the milling industry, costs of entry are high and, at present, the cost of capital is relatively high.

- The cost of transporting bakery products is high in view of generally low density and, for many products, short shelf life.

- In the bakery and processed products fields, advertising budgets can be significant and small firms have difficulty rationalizing major investments in advertising. Some firms have addressed this problem through licensing initiatives.

- The milling industry is running well below capacity. One large plant has been at about 65% capacity and foresees no potential to increase significantly its rate of utilization in the near future. Per capita consumption of wheat flour, which has been declining since the end of the Second World War, appears to have stabilized. Specialty flours, including barley, oat and rye flours have increased in volume but are still a relatively insignificant part of the total picture. The major negative in the wheat flour outlook has been declining export shipments. Over the last ten years, Canadian flour exports have fallen by roughly 50%.

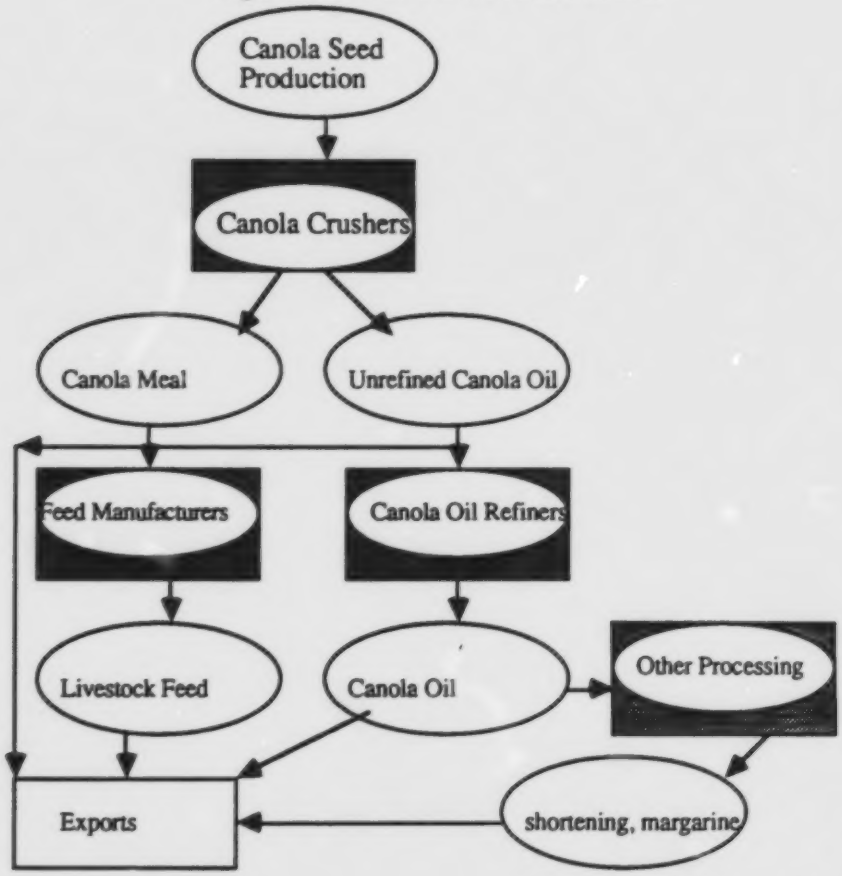
In summary, the firms that make up the wheat chain do not foresee significant negatives nor do they anticipate major new opportunities arising from a change in the method of payment. In the current circumstances of the industry, there are many factors other than the method of payment of the Crow benefit that determine operating and investment planning. Notwithstanding this rather neutral perceived impact, our analysis indicated that the interests of the firms in the wheat chain would be well served by a pay the producer approach.

III. Canola Chain

3.1. Processing Components and Products

The Canola processing chain in Alberta consists of the elements and products defined in Figure 2. A technical description of each element and product has been included in Appendix 3: Element and Product Identification of Processing Chains.

Figure 2: Canola Product Chain



3.2 Impact Analysis

In general, firms in the Canola processing chain are very positively disposed to a pay the producer approach to the Crow benefit. Anticipated impacts of pay the producer include: a more level playing field to compete with foreign buyers of Canola seed; a more acceptable level of financial return; new investment in plant; and, some increase in processing volumes which will result in increases in employment. Anticipated impacts vary substantially between firms, depending on their position in the processing chain and current experience in the market. Incremental savings resulting from the decline in canola seed costs were identified at each level of the chain: crushing, refining, and further processing of oil based products.

Canola Crushing:

The cost of seed is the single largest cost of operating a crushing operation, representing about 90% of operating costs. Processing of canola seed results in two products: crude oil and canola meal. Cost savings accruing from the decline in seed cost have been proportioned to the respective products based on **net realized value** or **relative-sales-value** of the two products; 70% to canola crude oil and 30% to canola meal. The 70% cost savings represents $13.62 savings transferred to crude oil production and the 30% savings in seed cost represents $5.84 savings transferred to canola meal production. Yield estimates of canola oil and meal from seed are 41% and 58%, respectively. Therefore, reduction in seed cost contributes $13.62 savings to the production of 410 kg. of oil and $5.84 savings to the production of 580 kg. of meal, an estimated savings of $33.22/tonne of oil and $10.07/tonne of meal.

Estimates of incremental savings resulting from a reduction in canola seed costs may be represented as follows:

Table III.1
Estimated Impact on Canola Crushing Industry

	Crude Oil	Meal
Input price savings on seed ($/t)	$19.46	$19.46
Relative-sales-value of savings*	$13.62	$5.84
Cost savings ($/t)**	$33.22	$10.07
Estimated Savings to the Crude Oil Industry ($ millions)* **		**$4.41**
Estimated Savings to Meal Processing ($ millions)** **		**$1.54**
Estimated Total Industry Impact ($millions)		**$5.95**

* Relative-sales-value of crude oil and meal are 70% and 30%, respectively.
** Price savings per tonne are calculated as relative-sales-volume savings ÷ 410 kg (41% yield) on crude oil and relative-sales-volume savings ÷ 580 kg(58% yield) on meal.
*** Estimated crude oil industry impact is based on oil production less WGTA eligible shipments (+2% crude yield factor) times $33.22/tonne (see page 19, summary of estimated impact).
**** Estimated meal production of 371,117 tonnes less WGTA eligible shipments of 218,431 tonnes(see page 19, summary of impact) indicates an eligible amount of 152,686 tonnes of meal. 152,686 tonnes x $10.07/tonne=estimated savings on meal processing.

In sum, the Canola crushing industry in Alberta is positively disposed to a pay the producer reform because it foresees opportunity for generally larger, positive margins, expanded processing activity and future investment leading to added employment.

Canola Oil Refining:

Extension of the estimates of crude oil price savings to impact on price of refined Canola oil are based on Canola oil prices estimated F.O.B. plant cash prices of $469/tonne [6]. Crude oil cost savings of $33.22/tonne, transferred to the production of refined oil, represent an incremental saving of approximately $33.90/tonne in refined oil price. Table III.2 presents the estimated cost savings that would be transferred to the savings on refined oil price assuming a full transfer of benefits.

[6] F.O.B. cash prices for oil and meal were determined from oil and meal futures less export cash basis, plus domestic basis. Prices were estimated as of August 4, 1989.

Table III.2
Estimated Impact on Canola Oil Refining Industry

	Refining
Input price savings on crude oil ($/t)	$33.22
Yield of refined oil from crude oil (%)	98%
Transferred cost savings ($/t)	$33.90
Relative cost savings/final product price (%)*	7.23%
Volume of eligible oil production (t)**	130,185
Estimated impact to refining industry ($ millions)* **	**$4.41**

Analysis assumes full benefits transfer to final product.
* Based on current oil price of $469/tonne F.O.B. plant.
** Eligible oil production is estimated based on average total oil production less WGTA eligible shipments.
*** Industry savings calculated as cost savings/tonne x eligible production.

Further Oil Processing:

Consistent with other processing chains, it is more difficult to project agricultural industry impacts the further up the value-added chain the analysis is pushed. There is no question that crushers would have the theoretical ability to offer refined oil to end product manufacturers and packagers at lower price levels.

At the level of firms engaged in end product manufacturing and packaging of Canola based products, oil costs represent about 50% of total operating costs. A 50% savings in operating cost could result in a potential savings of 3.61% in margarine price or $56.74/tonne of margarine.

Table III.3
Estimated Impact on Further Processing of Canola Oil

Input price savings on refined oil ($/t)	$33.90
Cost of input/ operating cost(%)	50%
Transferred cost savings ($/t)	$16.95
Relative cost savings/final product *(%)	3.61%
Savings in cost of margarine ($/t)	**$56.74**

Analysis assumes full benefits transfer to final product.
* Final product price is that of margarine estimated from 1985 value of shipment values for Canada of $259 million for 165 thousand tonne, an approximate value of $1570/tonne.

Summary of Estimated Impact on the Canola Processing Industry :

Based on total Alberta crush volumes of 651,095 tonnes and 628,617 tonnes for 1986/87 and 1987/88[7], respectively, estimates of oil and meal production for the same period were 262,341 tonnes and 371,117 tonnes, respectively. The WGTA includes canola seed, oil and meal destined for export. The industry is relatively neutral on effects with regard to WGTA elegible markets because increases in product (oil and meal) transportation charges would offset the declining seed values. For the same two year period, WGTA eligible shipment estimates of Alberta oil and meal were 132,156 tonnes and 218,431 tonnes, respectively. These estimates are based on total exports out of Alberta of 164,747 tonnes of oil and 351,281 tonnes of meal less U.S. exports of 32,591 tonnes of oil and 132,850 tonnes of meal. Industry estimates of shipments east of Thunder Bay were 26% of oil exports and 22% of meal exports. Therefore, the amount of oil and meal which should benefit from the pay-the-producer method of payment were estimated to be 130,185 tonnes and 152,686 tonnes, respectively.

Table III.4
Summary of Estimated Impact on the Canola Processing Industry

	Crude Oil	Refined Oil	Canola Meal
Transferred Savings ($/t)	$33.22	$33.90	$10.07
Volume of Product (t)	132,789 t	130,185t	152,686 t
Estimated Incremental Industry Savings ($ millions)	**$4.41**	**$4.41**	**$1.54**

In summary, the implications of pay the producer for the Canola processing chain are positive. There is no significant downside, although most of the domestic and offshore market implications are neutral. From an economic and commercial point of view, there is no question that the interest of firms in the industry will be well served by a pay the producer approach.

[7] Estimated total crush volumes and oil and meal production for 1986/87 and 1987/88 provided by Market Analysis Branch, Alberta Agriculture. Adjustments were made to account for Saskatchewan seed crushed in Lloyminister.

3.3 Further Considerations and Opportunities

For Canola crushers in Alberta, the last operating year was extremely disappointing. The price of seed was high and the price of oil relatively low, largely because of subsidies and trade policies of vegetable oil importing and exporting countries. As a result, crush margins were often negative and some plants experienced prolonged shut downs.

There are a number of additional considerations and opportunities which influence expansion in the Canola industry:

- Capacity utilization in the industry has been highly variable in recent years and also varies between firms. An industry estimate for capacity utilization in Alberta is 70 to 75%. This is based on a 300 day operating year. In fact, it is possible to shave a further 10 to 15 days per year off repair and maintenance allowances so that processing capacity could easily increase by 5% without any major capital investment. This past year, capacity utilization in the industry has been abnormally low.

- Not surprisingly, Alberta Canola crushers are keying on opportunities in the U.S. market. A decline in seed costs for western Canadian based crushers may well produce more acceptable levels of financial returns, particularly as the U.S. market matures and grows based on an appreciation of the quality advantages of Canola and reliability of supply from Western Canadian crushers.

- Given the expansion commitment of one large processor and the capability of other processors to expand crush with current plant, it is virtually certain that method of payment reform will support employment growth in the industry. The investment strategy for at least some other plants will be to add refining capacity. Ability to market refined product gives Alberta crushers a better position vis a vis the U.S. marketplace. With strength in the U.S. market and a larger provincial livestock industry to buy meal, the Alberta crushing industry would be much better placed to justify capacity investment.

- The cost of Canola seed has generally been too high in relation to the value of oil. This, of course, leads to narrow or negative crush margins. A major reason for this relationship is believed to be Japanese trade policies which allow Japanese crushers to buy seed without significant trade barriers but protect domestic oilseed

crushers behind a tariff wall of about $160/tonne for vegetable oil. Low international oil prices are also caused by subsidies offered by other oil exporters.

- Penetration of the U.S. market for oil and end products is constrained by significant tariff barriers. Even though the Canada/U.S. Free Trade Agreement set out a ten year schedule for the elimination of these tariffs, they are currently a significant barrier. The tariff on refined oil is 6.7%, on hydrogenated oil 8.1% and on end products ranges from about 15% to 18% by value.

- Some processors face a kind of "Catch 22" because the margin in the Canola products business tend to be higher at more advanced stages of the processing chain but current operations at the low end do not generate earnings required to finance investment in refining or packaging operations.

- The non-availability of WGTA rates to move Canola meal to Vancouver where it is positioned for trans-shipment into western U.S. feed markets has hurt. While meal has become increasingly important in western Canadian feed rations, this needs further development. A larger livestock industry in a post pay the producer environment will contribute to relieving this constraint.

- The Canola futures contract at the Winnipeg Commodity Exchange has some deficiencies associated with it from a crusher point of view. U.S. soybean crushers have a better risk management mechanism in their soybean futures and options markets.

- One crusher respondent mentioned the Canadian grain grading system as a problem. It is not designed to grade on the basis of the characteristics that are of real value to the crushing industry, namely the oil and protein content of the seed.

- Interestingly, at least some Alberta crushers see themselves as well positioned for the developing north/south trade in Canola products.

- There is significant vertical integration in the U.S. industry. Also there are dozens of primary processing and refining plants and hundreds of plants producing end products and packaged goods. Low cost production and sophisticated market knowledge are required by Canadian firms to prosper in this market.

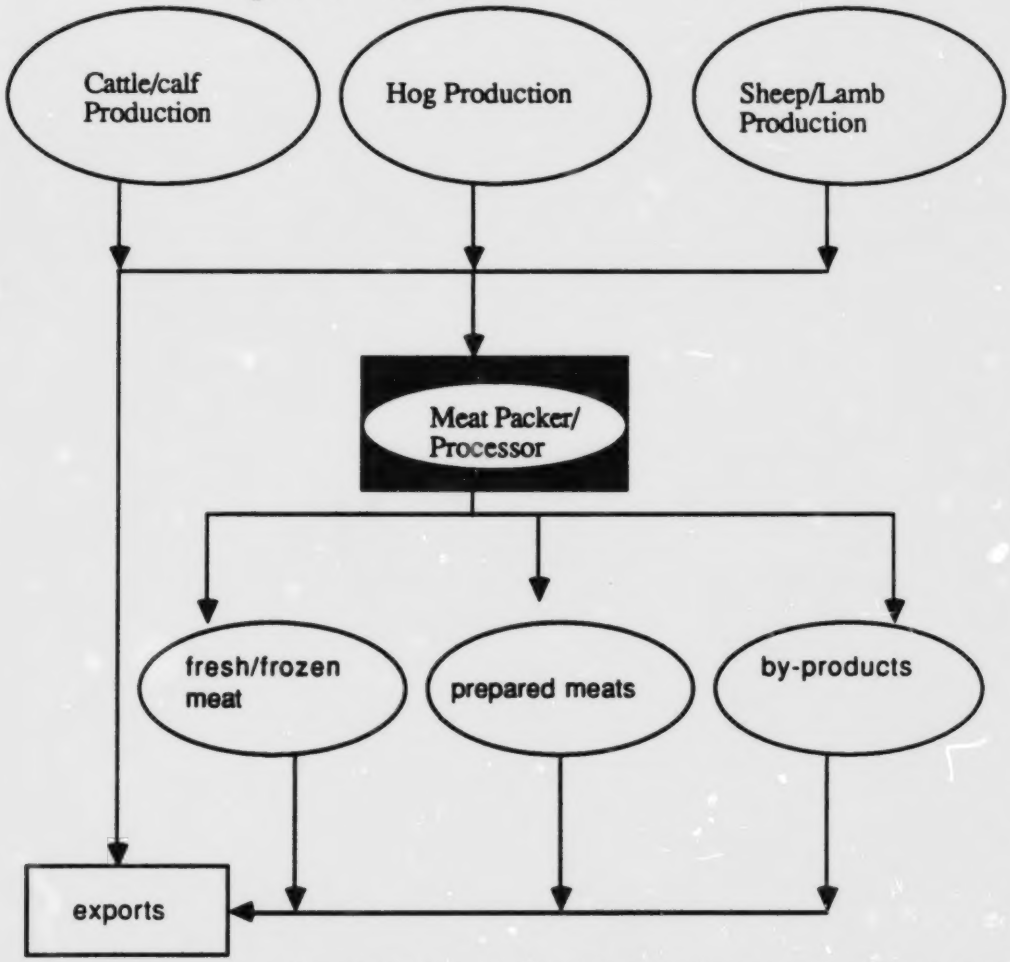
- A decline of 3.6% in oil input costs was judged to be a significant decline. However, it was felt that the decline would probably be passed through to consumers with relatively little impact on manufacturing or packaging volume, financial returns, employment or investment. The western Canadian market is already saturated. In fact, Canola products hold about 63% of the Canadian market for baking and frying fats, margarine and salad and cooking oil. The potential for Canola product to win a larger market share versus dairy or animal fat products is judged to be somewhat limited. In certain of these markets, Canola oil products already have a very substantial price advantage over substitute products. Further minimal price decreases are not likely to win more market share.

IV. Meat Chain

4.1 Processing Components and Products

The elements and products of the red meat chain are outlined in Figure 3. This simplified representation simplified identifies the major processing operations and broad product categories.

Figure 3: Meat Chain



A technical description of each element and product has been included in Appendix 3: Element and Product Identification of Processing Chains.

4.2 Impact Analysis

The estimates of Crow change impact on the livestock industry were constructed as intermediate input measurements to help assess Crow change impact to the meat packing/processing and other livestock processing industries.

Based on a study conducted on 34,564 cattle[8], production summary data indicated that yearling steers gain approximately 171 kg over an average of 115 days. These results are based on feed conversions of 7.04 kg/kg gain and grain content in the ration of approximately 67.5%. Analysis of impact of the Crow change on the swine industry was based on the grain content of various feed rations and feed usage per 100 kg based on production records from 4500 market hogs[9]. It is important to note that additional incremental savings may result from lower input costs of other feedstuff in rations (ie:screenings, canola meal, etc). However, feed trial data containing this data was not available and, therefore, analysis is limited to direct cost reduction resulting from lower feed grain costs. Estimates of feed conversion ratios (7.3:1) and grain content (25% of ration) for sheep were determined from the 1987 Cost of Production Study for Ewe-Lamb enterprises in Alberta, as well as conversations with the Alberta Agriculture Sheep Specialist. The following table incorporates the above ration information to determine incremental savings per animal.

Table IV.1
Estimated Impact on Livestock

	Steer	Hog	Sheep
Savings in feed cost ($/tonne)	$19.46	$19.46	$19.46
Feed conversion (kg/kg)	7.04	3.56	7.3
Feed eligible under Pay-the Producer (kg/kg gain)	4.75	3.03	1.83
Input costs savings ($/kg)	$.092	$.059	$.036
Saving per head ($)	**$15.81**	**$5.90**	**$1.88**

The Alberta Crow Benefit Offset Program (ACBOP), formerly the Alberta Feed Grain Market Adjustment Program, was designed to offset the distortion in feed grain prices resulting from the current method of payment

[8] Lakeside Research and L.A. Malmberg. An Analysis of the Impact of the Alberta Feed Grain Market Adjustment Program. Part one. June 16, 1986.

[9] Ibid.. Lakeside Research and L.A. Malmberg.

of Crow benefits. Feed users who purchase feed grain as livestock feed or who use homegrown feed are entitled to a $10/tonne reduction in feed cost. Livestock included under this program include beef and dairy cattle, hogs, poultry, sheep, goats, horses, bison and any other domestic livestock. Modification to the calculations of incremental savings to accommodate the ACBOP should therefore include an adjustment for the $10/tonne offset and were estimated as follows:

Table IV.2
Estimated Impact on Livestock With Adjustments for Alberta Crow Benefit Offset Program

	Steer	Hog	Sheep
Savings in feed cost ($/tonne)	$9.46	$9.46	$9.46
Feed conversion (kg/kg)	7.04	3.56	7.3
Feed eligible under Pay-the Producer (kg/kg gain)	4.75	3.03	1.83
Input costs savings ($/kg)	$.045	$.029	$.017
Saving per head ($)	**$7.70**	**$2.87**	**$.90**

The immediate industry cost saving was estimated using livestock production numbers for July 1, 1988. **These results do not include benefits from growth in production which other models have predicted.**

Table IV.3
Estimated Cost Savings at 1988 Production Levels

	Beef	Swine	Sheep
1988 production levels (million hd)	1.3	1.7	.198
A. Saving per head ($)	$15.81	$5.90	$1.88
Estimated cost savings ($millions)*	**$20.6**	**$10**	**$.37**
B. Adjusted for ACBOP			
Saving per head ($)	$7.70	$2.87	$.90
Estimated cost savings ($millions)*	**$10**	**$4.88**	**$.18**

*** These results do not include benefits from growth in production which other models have predicted.**

The above analysis for the red meat sector did not take into account adjustment for the National Tripartite Stabilization Program (NTSP). The NTSP models for hogs and slaughter cattle use a guaranteed margin formula to establish support levels. Adjustments which incorporate the NTSP have been included in Appendix 3. However, the NTSP effects on premiums and payout were marginal and therefore not included in the text.

• Meat Packing/Processors

Alberta livestock production represents a small proportion of the total North American market. U.S. production and consumption dominate the livestock industry. As a consequence, local supply inventory changes are anticipated to have only a small effect on product price. Reductions in feed costs are not anticipated to significantly impact livestock prices or change processor/packer margins.

Analysis of impact of change in method of payment of Crow benefits on the meat processing sector proceeded on the assumption that physical volume was a major factor affecting cost behavior of businesses. Analysis was based on cost/volume/profit relationships. Recent studies have predicted the supply effects on livestock resulting from a pay the producer method of benefit distribution. Results from these studies suggest that feedlot volumes may increase by 23% to 28%. These studies similarly report little or no impact on local hog supply. Therefore, analysis of volume/profit relationships will be limited to the beef packing sector.

The scenario used to estimate incremental effects of volume increases in the beef packing industry was modeled under the following assumptions:

- the relevant range of volume increases are 15%, 20%, 25%, and 30% ;
- fixed costs will remain constant and selling prices will remain unchanged; and,
- the variable costs are proportionate to volume.

With the aid of an industry spokesman, the beef packing scenario was modelled using the following industry standards:

Efficiency:	2.5 head/manpower hour
Variable costs:	$19 to $21 per head
(direct labor, direct materials, variable overhead)	
Fixed expenses:	$10 to $12 per head
(rents, taxes, marketing, insurance, building and depreciation)	

Estimated breakeven point (gross margin):	$33.00 per head
Average Capacity:	787 head per shift

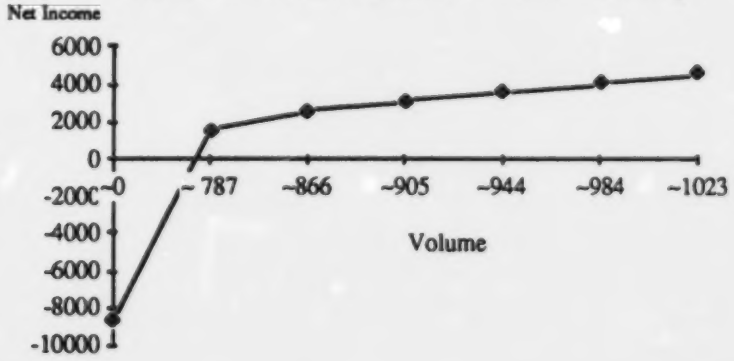
Table IV.4
Estimated Incremental Impact on Beef Packing Industry

Volume Increase	Δ Net Income (Profit)/shift
15%	$1534.65
20%	$2046.20
25%	$2557.75
30%	$3069.30

These figures demonstrate that an increase in volume could have a major positive impact on packing house profitability, notwithstanding a constant relationship between slaughter cattle price and meat price.

The above estimates were calculated based on strict assumptions. Other factors such as unit prices of inputs, efficiency, changes in production technology, legislation and strategic location were not factored into the analysis. Since fixed costs are not static year after year, a major change in fixed cost would require new forecasts of effects to targeted profits and contribution margins. The relationship between volume and profit is graphed below. At zero volume, the negative net income represents the fixed costs. The slope of the line is the rate of unit contribution margin. The intersection of the volume axis is the breakeven point. This analysis was based on average capacity of existing facilities. Appendix 3 contains a table listing the capacity of existing facilities in Alberta. It was estimated that 1988 weekly slaughtering were 84% of capacity. With the opening of the Cargill plant, excess capacity in the industry was estimated at 30%.

Chart 1: Profit/volume in Meat Packing



4.3 Further Considerations and Opportunities

Livestock Production:

Considerations identified by industry representatives as relevant to expansion and investment in the livestock industry were :

- Some meat packing/processing facilities require modernization in order to take advantage of potential increases in livestock supply.

- Some observers argue that the grain industry has historically been favoured at the expense of the western based livestock industry. In addition to the negative impacts of the Crow on prairie feed costs, the feed freight assistance program and relatively more favorable stabilization, subsidy and guarantee programs have been available for grain products. Not until recently have programs such as AFGMAP and ACBOP been designed with livestock producers' interests in mind. Although these programs have compensated the livestock producer, they have not re-dressed the historical imbalance because they are viewed as temporary while grain related programs are solidly entrenched.

- Government stabilization programs are believed by many to induce inefficient production. At the federal level, such programs are heavily weighted toward the grains sector. In 1987, the Government of Canada spent $3.9 billion in support of Canadian agriculture. The vast majority of this was directed towards grain.

- International beef is relatively inexpensive and there are stiff competitive pressures especially in the low end of the market. The Alberta grain-fed product is, however, not directly comparable to lower quality international product.

- Livestock producers already rely on the benefits of the ACBOP which presumably would be terminated under a "pay the producer" approach. When impacts are adjusted by the compensation already being received by the livestock industry, the magnitude of impacts are reduced by approximately 51%.

- Incorporating the National Tripartite Stabilization Program into the analysis results in a reduced impact from a change in the method of payment as a consequence of decreased support level prices. Although premiums are marginally reduced as well, the difference

in premium does not compensate for the reduction (actual or potential) in payouts.

Meat Processing/Packing

Further considerations relevant to expansion and investment in meat processing operations have been identified as:

- Sales opportunities for increased volume of beef products exist in the export market. Identified potential sales opportunities exist in the Eastern Canadian, North-Western United States, and the Pacific Rim (particularly Japan).

- The sales opportunities for increased volume of processed pork include such markets as Manitoba, Ontario and south to Iowa. The market to the south would primarily be one for fresh pork since some processors do not have a U.S. license for the brand name of their product. Canadian pork differs from that of the U.S.. The U.S. use a 15% to 20% larger animal. The Canadian meat product is leaner, better trimmed and shipped in smaller cuts. Although the Canadian product is more specialized, commodity spot prices in the U.S. do not fully reward this difference at the present time.

- Traditionally, processing plants tended to be located close to major retail markets and concentration in the processing industry corresponds to population distribution. The majority of meat processing in Canada takes place in Ontario and Quebec (greater than 60%), close to the large consumer markets. Domestic consumption of meat products is not anticipated to increase drastically in Alberta. Thus, processors must rely on cost competitiveness and efficient transportation services to capture a larger share of eastern markets and export markets for increased sales opportunities.

- The meat processing industry is dependent on the cyclical nature of livestock supply. This is more evident in the beef industry which is characterized by a longer cycle.

- There has been a decrease in consumer demand for red meat which recently appears to have stabilized into an essentially no growth situation. Demand for fish and poultry products has increased.

- Wages in Alberta meat processing plants are believed to be relatively higher than competitive U.S. plants.

- Pork packers/processors are operating have been operating under a contract with the Alberta Pork Producers Development Corporation which prices hogs based on Ontario prices. This contract ended July 20,1989. It has been suggested that as a consequence of the contract agreement, the Crow compensation (ACBOP) remained in the hands of hog producers and was not been passed through to the processing industry or to the consumer.

- The industry sees itself as far removed geographically from alternative markets. The U.S. can take advantage of the Mississippi, ocean ports and more highly developed and rationalized road and rail systems, while Alberta must deal with greater transportation costs.

- Processors suggest that increases in employment stem more from the use of brand names than from simply an increase in production. Establishing brand names in the market takes time, and as a consequence surpluses in fresh product develop.

- Canadian meat products differ from American products. Canadian raw cuts have more work embodied in them, and the animal is generally smaller. Canadians ship smaller cuts, and a leaner, better trimmed product. At the present time, the commodity spot price does not fully reward this difference.

- Trade barriers and tariffs create uncertainty in the market. Non-tariff barriers are increasing. Countervailing Duties on pork products is a severe cost or penalty on the industry and works against programs like the Crow Offset. Processors/packers need to know where the market is headed in order to plan and trade actions make this difficult.

- Alberta still exports a substantial amount of livestock to the U.S. and must rely on geographically accessible U.S. markets for export.

- One industry spokesman stresses that a packing house does not make money on just the sale of carcass beef, but rather on the returns achieved from by-products. By-products should be directed to the market which provides the highest return, i.e.:

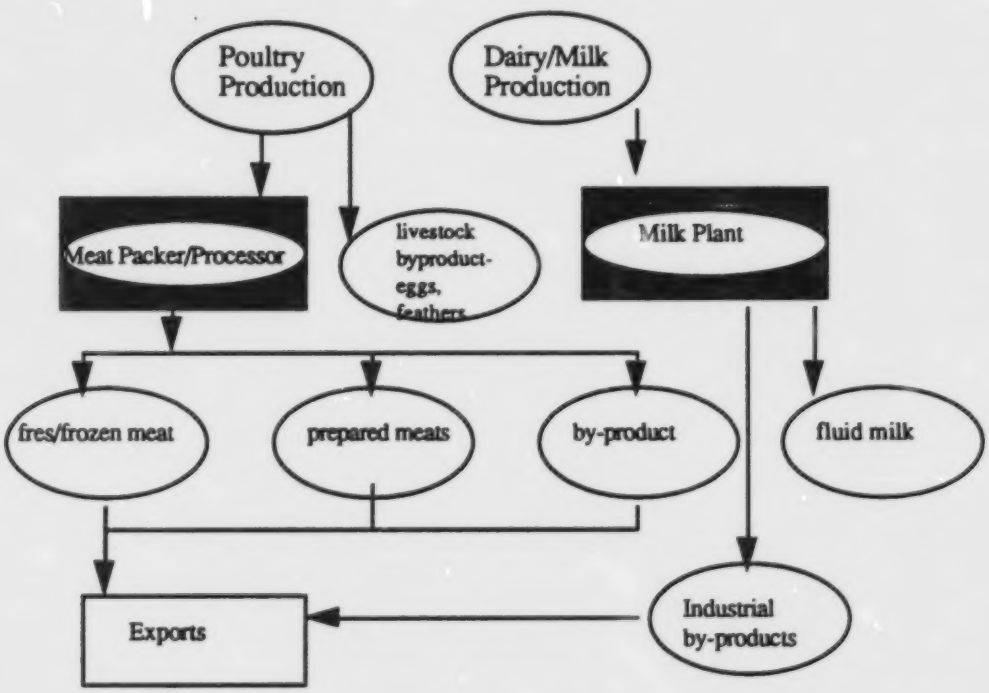
beef lips	Mexico	hides	Indonesia
tongues	Switzerland	fetal blood	France
hanging tenders	Japan		
beef feet	West Indies		

V. Supply Managed Sector

5.1 Processing Components and Products

The processing components and products relevant to the supply managed chain are illustrated in Figure 4. A technical description of each element of the chain is included in Appendix 3.

Figure 4: Supply Managed Chain



Dairy

Fluid milk pricing is set by a formula. A description of the components of the formula and their respective weightings is provided in Appendix 3. Dairy ration, one component given a weighting of 14% in the overall formula should decrease as a result of a change in Crow payment. Savings in feed costs are therefore anticipated to be transferred to the consumer through lower fluid milk prices. Calculations of impact from change in method of payment were based on information obtained from the average costs of production for Alberta for the 1988 year[10]. The estimated incremental cost savings to fluid milk producers is approximately 83¢/hL, ranging from 79¢/hL to 87¢/hL.

Alberta currently has 6.7% of the national **Industrial milk** quota (11,354 thousand kg. butter fat). Prices are set by a cost of production formula, however the sample in the cost of production (C.O.P.) survey is taken entirely from Ontario, Quebec and New Brunswick. The C.O.P. is based on a total farm approach where feed costs accounts for only 12% of total cost of $47.07/hL. Total cost becomes the target price. Therefore, changes in costs of goods resulting from a method of payment reform were not expected to have an impact on industrial milk prices. Benefits should accrue to the producers. Assuming a conversion factor of .036 (3.6% BF), Alberta industrial milk quota is approximately 315,389 thousand litres.

Table V.1
Estimated Dairy Industry Impact

Component:	Fluid Milk	Industrial Milk
Feed Conversion (kg/hL)	54.0	54.0
Eligible Feed (kg/hL)	42.5	42.5
Input Feed Savings ($/tonne)	19.46	19.46
Producer Cost Savings ($/hL)	.83	.83
Reduction in Processor Cost ($/hL)	.83	----
Total Production (thousands hL)	2,602	3,154.9
Estimated Industry Impact ($ millions)	**$2.16**	**$2.62**

10 Production and Resource Economics Branch. *1988 Cost of Fluid Milk Production in Alberta.* Alberta Agriculture.

Poultry

Eggs are priced by the Canadian Egg Marketing Agency based on a cost of production survey. Current industry standards for feed conversion (1.8kg/doz) and grain content in the ration (60%) were applied in the analysis. Similarly, average industry benchmarks for feed conversion and grain content were used in the analysis of impact on the **broiler chicken**, and **turkey** industries. Based on the market system relationships, an estimate of transfer of savings from producer to processor were estimated.

Table V.2
Estimated Poultry Industry Impact

	Eggs	Broiler Chicken	Turkey Hen	Turkey Tom	Turkey Broiler
	/doz	/kg	/kg	/kg	/kg
Feed Input Savings ($/tonne)	19.46	19.46	19.46	19.46	19.46
Feed Conversion (kg)	1.80	2.0	2.85	3.0	2.65
Eligible Feed (kg)	1.08	1.30	1.85	1.95	1.72
Producer Savings ($)	**.021**	**.025**	**.036**	**.038**	**.033**
Potential Impact to Industry ($ millions)*	$.68	$1.14		$.32	

* Industry savings are based on average provincial production of 32.325 million dozen of eggs, 45.698 million kg. of chicken and 8.895 million kg of turkey.

Estimated Industry Impact and Transfer of Savings:

Provincial production levels were used to calculate the effect of the impact on the supply managed industries. This static approach does not take into account the potential growth in the industry. Estimates of transfer of savings from producers to processors, retail and consumer were based on a most likely scenario and the structure of the marketing system. Savings in fluid milk production sector were anticipated to be eventually passed directly to the consumer. Savings in industrial milk production sector were predicted to remain in the hands of the producers. In the commercial egg industry, prices are set nationally by the Canadian Egg Marketing Agency in accordance with a national cost of production study. However, the national study is based on farms containing 8-50,000 birds/farm, and the average farm size in Alberta is only 6,000 birds. Egg prices in Alberta reflect prices in surplus provinces (Manitoba), with adjustments for transport costs. Decreases in Alberta production costs are not anticipated to significantly impact national price. Therefore, savings resulting from reductions in feed costs were anticipated to remain in the hands of the producer. Since retail prices have historically been fairly

inflexible under downward price pressure, producers and processors in the poultry meat industry were anticipated to share any net savings. The following Table V.3 presents the estimated impact to producers, processors and consumers under the assumption of 50/50 split of savings between the producing and processing sectors in the chicken and turkey industries.

Table V.3
Estimated Incremental Industry Net Savings

	Production	Producer	Processor	Consumer
Fluid Milk (thousand hL)	2602	—	—	$2,160,000
Industrial Milk (thousand hL)	3154.9	$2,619,000	—	—
Eggs	32,325,000 doz.	$678,825	—	—
Chicken	45,698,000 kg.	$571,225	$571,225	—
Turkey	8,895,000 kg.	$160,110	$160,110	—

5.3 Further Considerations and Opportunities

In the process of our investigations, the following considerations were identified:

Poultry

- Supply managed industries are limited as to the extent to which they can take advantage of economies of scale. Restrictions are a consequence of regulatory rather than economic factors.

- Alberta's pricing structure limits markets for Alberta poultry meat.

- Eggs are priced according to a national cost of production study. The average farm size in Alberta is lower than the size of farms participating in the study. Prices set by CEMA are based on a target price which includes a transportation differential or levy for egg disposal. Alberta imports eggs from Saskatchewan and Manitoba.

Dairy

- Industrial milk is priced federally by a cost formula based on Ontario, Quebec and New Brunswick production costs. Alberta

reportedly produces only 6.7% of the national industrial milk. Benefits are expected to accrue to producer.

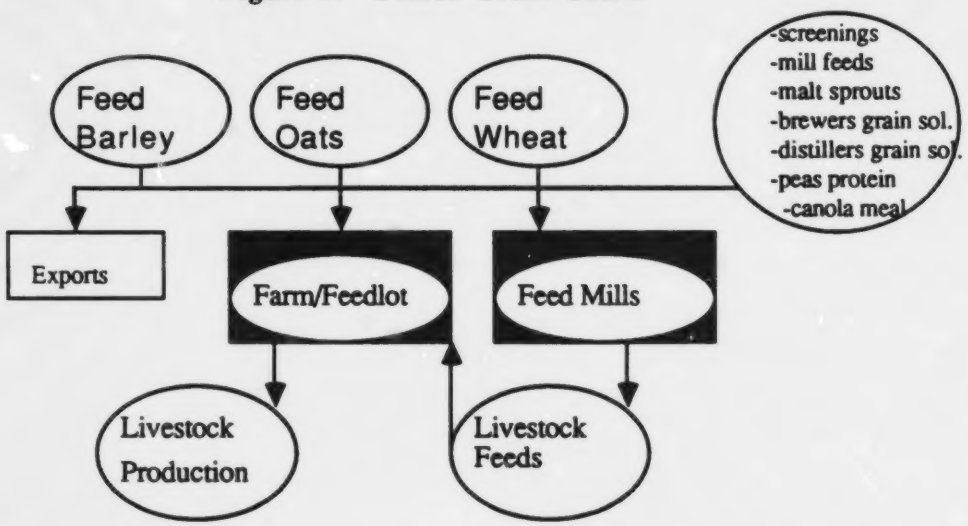
- Alberta fluid milk prices are based on a formula where feed costs (16% ration and hay) are incorporated as factors, however the Crow benefit has been accounted for in the formula.

VI. Coarse Grain Chain

6.1 Processing components and products

Top grades of grain have specific processing uses whereas lower grades are primarily used for feed manufacturing. By-products from flour mills, oilseed crushers, maltsters, breweries and distillers also find their way into feed manufacturing. Figure 4 identifies the components and products in the coarse grain chain. Alberta imported 75,041 tonnes of unmilled cereals in 1987: 9% from U.S.; 70.3% from Saskatchewan; 12.6% from Ontario; and, 8.1% from Manitoba..

Figure 5: Coarse Grain Chain



6.2 Impact Analysis

Anticipated growth in the livestock sector should increase demand for processed feeds and thereby increase utilization percentage of feed mills, resulting in higher profits to the feed industry. Gross margins in the feed industry are dependent upon the grain processing involved in the ration formulation and on the type of feed used. Feed mills tend to charge a milling or flat rate for the processing. Because of the competitive nature and

number of feed mills in the province, any benefits gained due to input cost reduction were believed to be passed on directly to the primary livestock producer. Only marginal profits associated with increased specialized milling (incorporating additional screenings, bran, shorts and middlings) were anticipated to remain within the feed industry.

Savings to be passed on to the livestock producer were calculated by type of ration. Since feed grain constitutes approximately 87% of material purchases by feed mills, it was used as the primary source of cost reduction in the analysis. The estimates were conservative because additional savings from other feedstuffs such as bran, screenings, brewer & distiller solubles, etc. would also contribute to savings. Table VI.1 presents the estimated savings in ration cost as determined by grain content and cost of raw material used by the surveyed feed mills.

Average feed ration costs per tonne as reported in the industry cost sheets published by several feed manufactures were used to estimate incremental savings by type of ration.

Table VI.1
Estimated Incremental Savings By Type of Ration

	Incremental Savings (%)	Ration Cost (/tonne)	Incremental savings (/tonne)
Hog Rations			
-Starter	4.41%-6.87%	$310	$12.4-$21.70
-Grower	8.19%-11.83%	$227	$18-$27
-Finisher	8.43%-11.83%	$190	$15-$22.80
-nursing	7.55%-11.83%	$215	$15-$25.80
Broiler Rations			
-starter	3.60%-7.22%	$300	$9-$22.74
-grower	6.13%-10.55%	$294	$17-$32.34
-finisher	6.76%-11.41%	$278	$17.87-$33.30
Beef Rations	6.62%-9.99%	$180	$11.32-$18.86
Dairy Rations	7.45-%11.24%	$215	$15.22-$25.37

The analysis above was based on least-cost rations and current market prices of ingredients. Linear programming was utilized by feed mills to determine the least cost ration formulations. A $19.46/tonne reduction in price of energy components of all cereal grain based diets was not anticipated to change the economic price relationships of barley, wheat, oats and corn. It has also been suggested that roughage utilization would decrease as a consequence of cheaper energy ingredients. Although these are sound considerations, conclusions from a previous study conducted by Lakeside Research [11] support the hypothesis that drastic changes in

11. Ibid...Lakeside Research and L.A. Malmberg.

composition of rations are not anticipated. Reasons for this conclusion include:

- reducing each cereal ingredient by $19.46/tonne should not result in a change in their relative portion in the least cost formulation
- ruminant diets are generally formulated for inclusion of a minimal amount of roughage
- excessive energy in calf grower diets results in early fattening and possible downgrading

6.3 Further Considerations and Opportunities

Constraints identified by feed mills included:

- Profit is based on cost of raw ingredients plus a flat $/tonne markup or margin and, therefore impact from a change in method of payment may be marginal. The industry is very competitive and cost savings are passed on to the feed consumer. Any increase in earnings will arise because of volume increases rather than higher margins.

- Specialty grinding, additives and increase in availability of screenings and meal may provide some profit.

- The feed industry is operating well below capacity (65-70% of capacity). Substantial changes in the livestock sector would be required before new investment is stimulated.

- Regulations by U.S., Canada, and CWB make exports into the Northern States difficult for feedstuffs. Exports are estimated to be only 1% of the production.

- No change to employment in the industry is expected.

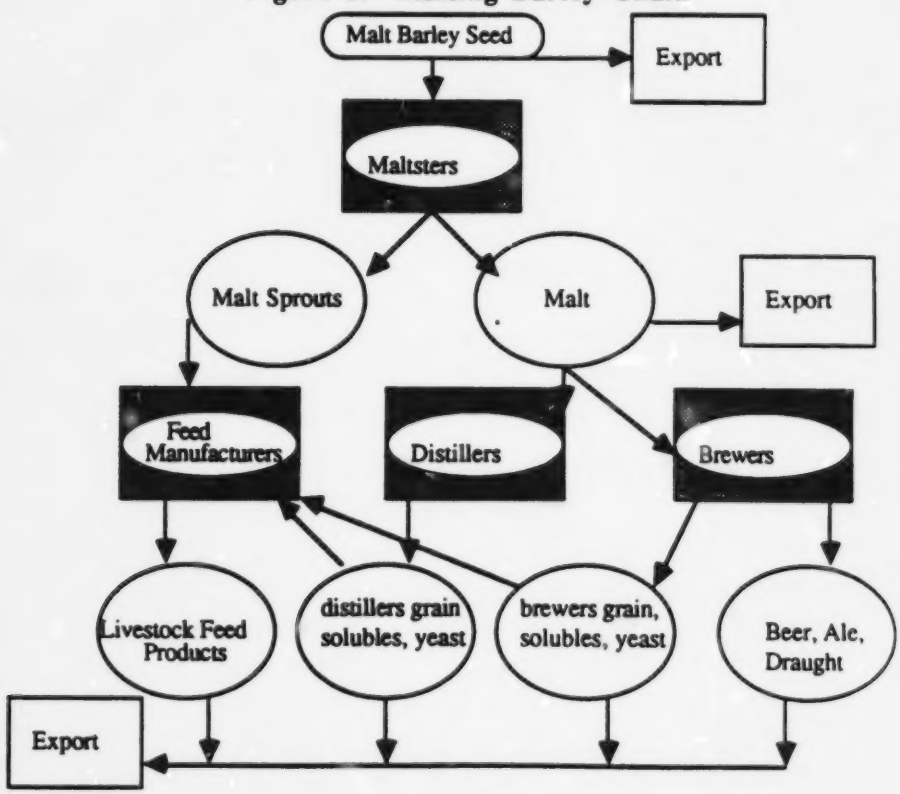
- In some areas of the province where mills are operating at full capacity, plant expansion may be triggered.

VII. Malt/Brewer/Distiller Chain

7.1 Processing Components and Products

The malting barley chain in Alberta consists of the elements identified in Figure 5. The major processing activity in this chain occurs through malting companies and breweries for the production of the end products of beer and ale. Identification of impacts associated with change in method of payment of Crow benefits concentrated on these processing operations and product categories.

Figure 6: Malting Barley Chain



Information regarding pricing scenarios and other changes related to method of payment reform were presented to the malting companies and breweries identified in the malt barley chain.

Malting:

It was estimated that raw material costs (cost of malt barley) represent approximately 2/3 of total production costs and about 50% of total sales. Malt barley was purchased through the CWB with the price reflecting a combination of domestic and export prices. Domestic prices, instore Vancouver, were posted for the Calgary plant. Export prices were negotiated with the board and generally reflect world prices. Given a yield of malting barley to malt product of 77.5%, the estimated cost savings on malt barley was $25.11/tonne or 4.57% of the current selling price of the malt product.

Table VII.1
Estimated Impact on Malt Industry

	Malting
Input price savings ($/t)	$19.46
Yield of input/product (%)	77.5
Malt cost savings ($/t)	$25.11
Incremental malt price savings (%)*	4.57%
Total eligible production (t)**	77,519
Total savings to industry ($ millions)* **	**$1.5**

* Based on a current malt price estimate of $550/tonne.

** Eligible production is the proportion of domestic use (55,025 tonnes) plus a 22.5% shrinkage portion of the export amount (22,494 tonnes)[see page 40, Estimated Industry Impact].

** Calculation is based on eligible production times seed savings of $19.46/tonne.

Brewing:

All the malt used in the brewing industry was purchased locally, and all domestic beer sales were direct to the Alberta Liquor Control Board. Malt was reported to represent between 2% to 4.6% of the sales value of beer, depending on level of malting adjuncts used. The brewery industry indicated average wholesale prices for beer of $7.00/ dozen. This information was used in the following industry analysis:

Table VII.2
Estimated Impact on Brewing Industry

	Malt Cost	
	2% of sales	4.6% of sales
Input cost savings ($/t)	$25.11	$25.11
Cost of input/product sales(%)	2%	4.6%
Malt cost savings ($/t)	$.502	$1.16
Beer price/dozen ($)	$.0064	$.0147
Incremental Industry Savings ($ millions)	**$.25**	**$.57**

Distilling:

Two final products were analyzed in the distilling chain: alcohol from corn produced in the Bow Island district; and, alcohol from rye for the manufacture of whiskey. Adjustments were incorporated for the distillers dried grain primarily shipped to B.C. under WGTA rates. Table VI.3 presents the results from the analysis.

Table VII.3
Estimated Impact on Distilling Industry

	Corn	Rye
Input cost savings ($/t)	$19.46	$19.46
Cost of input/product sales (%)	4.58%	4.58%
Input cost savings ($/t)	$.891	$.891
Liquor price/ 25 oz. ($)	$.011	$.021

Estimated Industry Impact:

Malt production in Alberta has been estimated at 155,000 tonnes. Of the total malt production, 64.5% was exported through Vancouver (7% of which is distillers malt, and 93% brewers malt). Exports were primarily to the Pacific Rim and Japan. The yield was reported to be 77.5% from malt barley to malt product, therefore an estimated 22.5% of the product exported received a savings due to shrinkage. The amount of malt product which benefitted from a reduction in the cost of malt barley was:

155,000 tonnes x 35.5% domestic use =	55,025 tonnes
155,000 tonnes x 64.5% export x 22.5% shrinkage=	22,494 tonnes
Total amount of malt impact	77,519 tonnes

Impact to malt industry was estimated at $1,508,520 (77,519 tonnes x $19.46/tonne).

The Alberta Liquor Control Board reported the following quantities of domestic liquor purchases for 1988:

Beer	1,575,810 hL
vodka	75,210 hL
whiskey	36,148 hL

Table VII.4
Summary of Estimated Impact on Malt/Brewing/Distilling Industry

	Malt	Brewing	Vodka	Whiskey
Input price savings	$25.11/tonne	$.257/hL	$1.55/hL	.$2.99/hL
Domestic ALCB Liquor Sales (hL)	—	1,575,810	75,210	36,148
Incremental Industry Savings ($ thousands)	**$1,508**	**$406**	**$116.5**	**$108**

Analysis does not include potential reduction in sales tax or retail mark-up.

7.3 Further Considerations and Opportunities

Constraints to the brewing and malting industry have been identified as:

- Provincial regulations concerning production and marketing of alcoholic beverages (e.g. historical rules relating to in-province production)

- Uncertainty regarding impact of change in method of payment on the CWB pricing policy for malting barley. As a monopoly seller in the Canadian market, the Board can make it difficult for Canadian processors to stay competitive, especially with respect to competition and products from U.S. based processors.

- The malting industry will pass any savings on directly to their customers. Malt is priced in relation to malt barley price plus overhead cost and production costs.. No direct impact is anticipated in the **malting** industry. Potential investment would result from increased sales, however the malt represents only a small fraction of the cost of beer production.

- About 95% of malt consumed in Canada is used in the brewing industry. The target population for beer consumption is decreasing. Demand for beer is expected to decrease in the future.

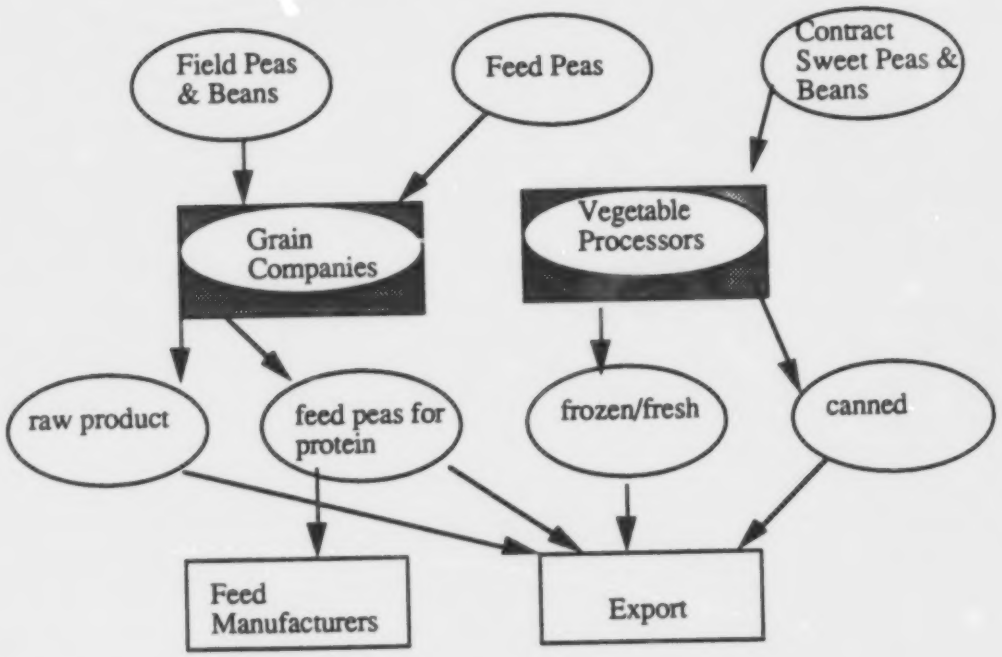
- One malt producer has suggested that the U.S. market is self-sufficient in malt. Approximately 13% of brewers malt product is trucked to B.C. breweries. Alberta does not currently produce special malt product. Very little malt is currently being used by distillers in Alberta.

VIII. Beans, Peas and Protein

8.1 Processing Components and Products

The major pulse crops grown in Alberta include beans, peas and lentils. Alberta is a net exporter of dried peas and beans. Average marketings of dried beans were 8946 tonnes over the period 1984 to 1988. Production of peas over the 1984 to 1988 period averaged 43,266 tonnes. Figure 7 outlines the major components of the bean and pea chain.

Figure 7: Peas, Beans & Protein Chain



A technical description of each element and product has been included in Appendix 3: Element and Product Identification of Processing Chains.

8.2 Impact Analysis

Raw material costs (dried beans and peas) represent a relatively high proportion of the final product sales value in the dried bean and pea processing industry (≈80%). Table VIII.1 presents the estimated savings in final product as a consequence of an anticipated $19.46/tonne reduction in input cost.

Most processing of dried peas and beans in Alberta involves cleaning and some packaging. Gross margins are reported to range between 6¢ and 6.5¢ per lb. for dried beans. From the processors contacted, it was determined that most of the product is exported (dried beans≈97%, dried peas≈70%). Any additional transportation costs associated with Crow benefit change will be directly passed on to the producer. A large portion of the commodity is currently shipped east. Direction of shipments is not expected to change. One processor's estimate of domestic consumption of dried beans is only 3% of his total product. Increased domestic demand is not anticipated since per capita consumption (less than 2 lbs/person/year) is not expected to rise.

Table VIII.1
Estimated Impact on Bean/Peas

	Dried Beans	Dried Peas
Input price savings ($/t)	$19.46	$19.46
Amount produced/marketed (t)	14,285t	111,633t
Proportion of domestic production/mkting(%)	3%	30%
Estimated Incremental Industry Impact	**($)$8,340**	**$651,713**

No impact resulting from a change in crow benefit payment was anticipated for the processors of sweet peas. This industry currently satisfies the needs of local grocers, and exports only a small proportion to the eastern market. Most of the transportation is handled by truck.

8.3 Further Considerations and Opportunities

The following factors must also be considered in determination of industry impact:

- Vegetables are highly climate dependent.
- Processors contract for high quality. Prices and grade are determined by the processor upon delivery.
- Most of the dried beans produced in Alberta are exported (97%). There is a limited domestic demand due to low consumption levels (estimated at less than 2 lbs/person/year).
- Alberta is geographically disadvantaged in comparison to her major competition (U.S.).
- Processors express concern regarding future increases in rail transportation costs.
- One processor does not anticipate future investment since expansion of present facilities were just completed in 1987.

Table X: SUMMARY OF POTENTIAL SAVINGS BY INDUSTRY

Industry:	Estimated Impact/Unit	Industry Cost Savings
Wheat:		
Cereal Flour Milling	$27.03/tonne	$6.59 million
Bakery	$.028/loaf	$4.06 million*
Pasta	$.41/20 kg.	$.24 million*
Canola:		
Crude Oil	$33.22/tonne	$4.41 million
Refined Oil	$33.90/tonne	$4.41 million
Canola Meal	$10.07/tonne	$1.54 million
Margarine	$56.74/tonne	
Livestock:		
without ACBOP:		
Feedlot	$15.81/hd.	$20.6 million
Swine	$5.90/hd.	$10 million
Sheep	$1.88/hd.	$.37 million
with ACBOP:		
Feedlot	$7.70/hd.	$10 million
Swine	$2.87/hd.	$4.88 million
Sheep	$.90/hd.	$.18 million
Meat Packer/Processor(Beef):		
15% increase in volume	$1535/shift	
20% increase in volume	$2046/shift	
25% increase in volume	$2558/shift	
30% increase in volume	$3069/shift	
Pork:	no anticipated volume increase	
Supply Managed:		
Fluid Milk	$.83/hL	$2.16 million
Industrial Milk	$.83/hL	$2.62 million
Eggs	$.021/dozen	$.68 million
Chicken	$.025/kg.	$1.14 million
Turkey	$.036/kg.	$.32 million
Feed Industry:	$20.04/tonne*	
Malt/Brewing/Distilling:		
Malt	$25.11/tonne	$1.5 million
Brewing	$.257/hL	$.406 million*
Vodka	$.155/hL	$.117 million*
Whiskey	$2.99/hL	$.11 million*
Bean/Pea:		
Dried Beans	$19.46/tonne	$8.3 thousand
Dried Peas	$19.46/tonne	$651.7 thousand

Estimated industry impact is based on assumptions of transfer of full benefit to final product, with the exception of the meat packing/processing sector. Total industry impact is based on estimated eligible production with the exception of the bakery, pasta, and feed industries where estimates were based on value of shipments.

***Inputs used in these sectors do not necessarily account for total output from primary producers.**

IX. OTHER ISSUES

The "Method of Payment" issue is but one of several significant issues facing Alberta's food processing industry. Set out below are some brief comments on some of the other issues confronting the industry which must be considered along with the "Method of Payment" issue.

a. State of Development

There is an inherent risk in making broad generalizations but it may be safe to say that Alberta's food processing industry, in total, is still in a state of infancy. Certainly, some sectors within the total industry are more highly developed than others, but the total industry in Alberta has produced relatively small amounts of total Canadian exports. Set out below are export figures for major industry sectors:

	1982($000's)			1987($000's)		
	Total Canadian Exports	Alberta Exports	Alberta - %	Total Canadian Exports	Alberta Exports	Alberta - %
Processed meats	32,224	964	2.99%	73,286	14,289	19.50%
Meat - Fresh, Chilled or frozen	745,775	66,975	8.98%	1,006,312	190,577	18.94%
Vegetables and Vegetable Preparation	270,377	4,352	1.61%	421,906	22,644	5.37%

While significant growth has taken place in recent years, much of this growth has been in the livestock sector and its related industries. With Alberta producing upwards of 40% of Canada's cattle, much potential remains for continued development of the further processing of that production. This will require a significant investment in new and upgraded processing facilities and the development of additional markets. In the non-livestock sectors, similar investment will be required to develop the industry. With the relatively small local population, Alberta processors will need to develop new markets with larger population bases - clearly, transportation costs will be an important factor influencing the ability of Alberta processors to access these markets.

b. Existing investment in the food processing industry

Much of the present Canadian investment in food processing physical plant is located in Eastern Canada in closer proximity to larger population bases. Some proponents of a "Pay the Producer" policy would suggest that the present system of paying Crow benefits to the railways has been a major reason for such physical plant having been located in Eastern Canada because the present policy artificially raises the cost of certain commodities (i.e. those which benefit from the Crow subsidy) to Alberta processors. While this may be true, there still remain significant ingredient cost advantages for Alberta processors as compared to their Eastern Canadian competitors. These advantages arise from the additional costs incurred to move the grain from Thunder Bay to the Eastern processor. In the case of barley such costs amount to about $28 per tonne.

The total economic advantage to Alberta processors exceeds just the transportation cost differentials noted above. As producers incur primary elevator charges (approximately $9 per tonne for barley and $7 per tonne for wheat) when grain is entered into the mainstream handling system, this cost can be avoided when Alberta processors buy direct (for off-board grains) from Alberta primary producers. Thus, the total cost advantage, in the case of barley, may be as high as $38 per tonne.

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It would appear that to date the cost savings that could be enjoyed by locating major processing facilities in Alberta, with a view to shipping product into the Eastern Canadian market, have been outweighed by the benefits of locating the plants closer to the larger population bases. A change in the method of payment will change the cost/benefit analysis, but by itself is not the only issue influencing investment decisions. Additional detailed study would be necessary to evaluate the impact of the non-"pay the producer" factors in these investment decisions.

With significant investment in food processing capacity in Eastern Canada, it is unlikely that a change in the method of payment would see a movement of such processing capacity to Alberta. We believe the major longer-term opportunities lie with development of southern U.S. (West Coast) and Pacific Rim markets. To the extent Eastern Canadian processors need to expand their plant capacity, or want to access new markets, such as U.S. (West Coast) or Pacific Rim a change in the method of payment, together with the other cost savings that can be realized by being closer to the source of raw materials, may help to attract

additional investment in Alberta-based food processing plant and equipment.

c. Future impact of present WGTA subsidy formula

The present WGTA subsidy formula is likely to see the government's share of transportation costs decrease with an increase in the producer's share. Some analysts have projected that by the year 1999, the producer's share of railway costs will have increased to 57.35%. The accuracy of such projections, depends of course, upon the future inflation rates, volume movements and the maintenance of the present cost sharing formula. Regardless of the degree of precision in these projections, it would seem clear that the impact of a "pay the producer" versus a "pay the railways" policy is likely to diminish with the passage of time. In fact, government's share of rate is anticipated to level gradually such that the basis between producer and government share stabilizes at approximately $15-$17/tonne. Accordingly, the major benefit to be derived from a change in the method of payment is to create a short-term "window of opportunity". WGTA policy reform will accelerate the economic pressures favouring investment of and expansion in value added industries. However, as pointed out previously, method of payment reform may be a necessary but not sufficient condition to secure such investment.

d. Free trade agreement (FTA)

A change in the method of payment to a "pay the producer" policy would enhance the ability of certain sectors (principally in the livestock related areas) of Alberta's food processing industry to take advantage of increased access to U.S. markets as result of the FTA. While the benefits of a "pay the producer" policy may be eroded in time (as noted above under item c), such a change in policy may create additional stimulus for increased investment and processing activity in Alberta. A change in method of payment is unlikely to shift Eastern Canadian investment away from that market place into Alberta. It may, however, assist in stimulating investment activity targeted at the Pacific Rim and U.S. markets.

An additional, but unquantifiable aspect of a change in the method of payment, is the possibility that such a change would be more acceptable to Canada's trading partners than the present system which is viewed as being a direct export subsidy. If such a change would be more acceptable to the United States, it would seem that the risk of countervail action should be reduced and

longer term opportunities to access U.S. markets should be enhanced.

e. Transportation System Rationalization

As producers become responsible for actual cost of transportation there will be increased pressure for system rationalization and increased efficiency. The result will be a lower cost grain handling and transportation system.

X. CONCLUSIONS

In several agricultural processing sectors, firms have done surprisingly little analysis of possible implications of a change in the method of payment. No doubt this is because the change is speculative at this point and, in fact, may be implemented in the form of several alternative mechanisms which makes impact analysis difficult. In the course of interviews, most senior managers who were encouraged to offer opinions on impacts were at worst neutral and, at best enthusiastic, about the direction and magnitude of change.

Many senior managers in firms had not fully conceptualized the impact of pay the producer on their firm or industry. Most saw the change as a potential cost reduction which, for most firms, it indeed is. But several firms did not realize that it was a cost reduction that would affect their comparative advantage because it would be captured only in their region and not by any of their competitors in other regions (eg. in the western U.S., or eastern Canada). One often overlooked implication is that western based firms would have opportunity to win a larger market share within the western Canadian domestic market.

One deficiency of the study is that its terms of reference did not allow for a canvass of processing firms not presently operating in Alberta but who might find Alberta increasingly attractive as a business location under a pay the producer regime. Oat milling firms would be an example of potential investors who would be encouraged by the pay the producer.

The time frame for the price scenario may have been overly restrictive. Particularly for industries operating well under capacity, five years may not offer sufficient time for the dynamic and structural implications of pay the producer to have full impact. The important questions to ask, particularly for nationally or internationally oriented firms in meat processing, cereal milling or oilseed crushing, would be "when present capacity is more fully utilized and you consider your next round of investment, will you be relatively more attracted to Alberta under a pay the producer regime"? The answer to this question will almost certainly be yes. However, actual investment and processing activity may take ten or more years to develop.

Economic theory suggests that a pay the producer approach to the Crow Benefit should have positive impacts on Alberta's livestock and value added processing industries. The economic impacts will be both short term and long term in nature. Short term impacts may include improved financial performance and consumer benefits resulting from a lower cost structure.

Over the longer term, changes in regional comparative advantage should affect investment decisions with consequent plant establishment and expansion and increased processing volume and employment in the province.

Discussions with senior managers in agricultural firms suggest that the predictions of economic theory will, by and large, be borne out in practice. Most, but not all, of the managers interviewed were positively inclined to the reform of Crow benefit payments. In some industry segments, respondents were neutral. Very few respondents were negative.

There is some evidence that senior managers in many firms have not yet commenced a thorough business analysis of the implications of method of payment. When such analysis is undertaken it will no doubt confirm the predictions of economic theory particularly when long term implications are considered. For the most part, impacts will not be immediate and dramatic for agricultural processing. However, over time, the economic environment created by pay the producer will be more conductive to sound investment decisions and more acceptable levels of profitability.

Further analytical work should be undertaken wherever negative implications were foreseen to determine whether any mitigating action can be taken.

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Appendix 1: METHOD OF PAYMENT REFORM

Historical Developments

With the possible exception of energy resource policies, no economic issue in Alberta has received as much analysis and debate as grain freight rates over the last 15 years. Four major commissions and reviews have been addressed, in whole or in part, at the Crows Nest Pass freight rates. Each of these exercises generated scores of position papers from interested groups, technical analyses and hundreds of media reports.

The purpose of this section is to focus on method of payment alternatives for the Crow benefit. The method of payment has implications for further processing of agricultural products, diversification of Alberta's economy and the further rationalization of the grain handling and transportation systems in Alberta and throughout the prairie region.

Intense pressure to reform western grain transportation policy mounted early in the 1970's. Inflation and rapid increases in grain export volumes combined to magnify the deficiencies of a fixed rate, highly regulated approach to the rail carriage of grain. Simply put, grain freight rates, fixed statutorily in 1898, were increasingly driving the railways into a deeply unprofitable position. As a consequence, the railways could not justify investment in equipment and system capacity to haul grain.

Recognizing the problem, the federal government initiated the short-term fix of buying grain hopper cars in 1972. Throughout the 1970's, the governments of Alberta and Saskatchewan as well as the Canadian Wheat Board also bought hopper cars.

Several commissions, studies and initiatives were launched to devise a long term solution. The milestones are as follows:

- **Mr. Justice Emmet Hall's Commission** recommended in April 1977 that the federal government should subsidize the railways for losses incurred as a result of fixed rates. Hall recommended retention of the benefits of the Crow rate, although

he did not explicitly say that the rate should be frozen at the 1898 level.

- The **"Snavely Report"**, released in September of 1978, calculated the railways' losses on hauling grain. The Snavely Commission estimated that statutory rate revenues covered 38% of the total rail costs of grain movements, government subsidies covered 24% while the balance of 38% was left with the railways as a loss.

- The **"Gilson Report"** was released in 1982. This report reflected wide ranging consultations on questions relating to western grain transportation reform and, in particular, method of payment options. The Gilson report reflected a consensus that western grain producers were entitled to a continued "Crow Benefit".

- **Bill C-155, The Western Grain Transportation Act,** was first formulated on the basis of Dr. Gilson's recommendations that the benefit should be split between producers and the railways with a phase-in period ending up in an 81% share paid to producers and 19% paid to the railways. However, before the legislation was actually introduced, pressure from prairie Pool organizations and Quebec farm organizations and the Quebec Liberal caucus caused the government to veer away from Dr. Gilson's approach to method of payment. When the legislation was passed in November of 1983, the Crow Benefit was to be paid entirely to the railways. Recognizing that this approach was not optimal from an economic efficiency perspective, the Government of the day included a section directing the Governor-in Council to appoint, before April 1, 1984, a Committee to "examine all matters that, in its opinion, pertain to the method of payment in respect to grain transportation, and would be most conducive to agricultural development in Canada".

- In compliance with this legislative requirement, **Mr. Justice Gordon Hall** of the Manitoba Court of Appeal was appointed to head a Committee of Inquiry on methods of payment. His inquiry reported in March of 1985. The report recommended that the Crow Benefit be paid to grain producers in the Canadian Wheat Board designated area. The proposed mechanism for making the payment was the Grain Transportation Refund (GTR). Actual payments, under this system, were to be apportioned to individual producers on the basis of their net sales of eligible costs in each crop year. (Net sales equal the total quantity of all statutory grain sold by a farmer minus any purchases of statutory grain.)

Benefits would be paid out of all government funds in support of grain transportation including the 1981-82 fund of $658.6 million/year plus any federal government contributions under the inflation protection and safety net provisions of the WGTA.

- The **Federal Grain Transportation Agency** completed its comprehensive review of the WGTA in April of 1986. A primary focus of consultation and analysis was the GTR method of payment proposed by Justice Gordon Hall. The agency recommended that the federal government should not implement the GTR. Instead, a "pay-out" proposal was advanced. Under this proposal, the federal government would pay producers a sum sufficient to provide them in future with income equivalent to what they would have received under the Crow subsidy. The agency recommended that the Minister of Transport establish a task force to determine the administrative requirements for the pay-out. This recommendation was not acted upon.

Method of Payment Proposals

During the course of the many investigations of WGTA issues, scores of suggestions were made related to the method of payment. Following are brief descriptions of the major proposals to pay all or a part of the Crow benefit to the producer.

- The Gilson proposal calculated producer entitlements to the Crow Benefit on the basis of land productivity ratings and historical, distance related transportation rates. Payments to individual producers would be made either directly at the time of delivery or indirectly credited to an account where transportation charges on grain would be debited. An adjustment fund would be created to compensate grain producers for losses due to dilution of benefits across expanded volumes of grain eligible for payments. There would be a 6 year phase-in period starting with a 50/50 split of the Crow benefit between producer and railway payments and eventually moving to a 81/19 split between producer and railways.

- The historical marketings approach would determine a producer's share of the Crow Benefit on the basis of actual past usage of the grain marketing system. Dilution would be considerably less than under the Gilson acreage based approach since compensation would reflect an individual"s actual past performance.

- The Double 80 proposal was developed by Alberta interests. It resembles the Gilson proposal in that it is primarily acreage based

and specifies that 80% of the benefit should be paid to the producer and 20% to the railway. The proposal also suggested limiting 80% of the entitlement to acreage related calculations.

- The Producer Freight Entitlement proposal was originally developed by Manitoba interests. Producer entitlements to the Crow Benefit would be calculated on an acreage productivity basis similar to the Gilson proposal and also on recorded historical marketings. Producers would then choose either the production or marketings based entitlement. Dilution arising from these calculations would be covered by an additional funding injection, presumably from the federal government, of between $35 and $70 million annually. The actual benefits to producers would be in the form of a freight credit which is drawn against as grain is delivered. The Freight Entitlement proposal was an attempt to strike a compromise between providing benefits to all producers capable of growing WGTA statutory grains and also to producers who have historically benefitted from the Crow rate.

- The Grain Transportation Refund (GTR) was developed for Justice Gordon Hall's inquiry on the method of payment by Professor Kraft at the University of Manitoba. The GTR approach is thoroughly described in a 51 page appendix to the Hall inquiry report. Its basic elements are as follows:

  1) The total quantity of all statutory grain sold by a farmer would be reduced by any purchases of statutory grain. This sum would be the quantity of grain eligible for a share of the government funds in support of grain transportation. The net sales arrangement is required to prevent producers from selling grain, buying it back and then reselling it.

  2) An administrative agency would maintain an account for each grain seller and buyer. At the end of the year, verification and balancing of all sales and purchasers would be made. Payments to producers could be made on a quarterly basis, with provision for a final payment once accounts have been verified at year end.

- The "Pay Out" alternative was developed by federal Grain Transportation Agency researchers during their comprehensive review of the WGTA. The concept of a pay out approach is not new: it was explicitly discussed in terms of a "Crow Bond" in an Institute for Research on Public Policy report published in 1980. The GTA report did not propose details of how the pay out of the Crow benefit would be effected. The basic idea is to provide farmers with an economic benefit equal to the net present value of

the Crow Benefit. The GTA recommended that a Task Force should be established to determine the following factors:

1) The basis for the pay out;
2) The method for the pay out;
3) The time frame for the pay out;
4) The inflation sharing and safety net requirements for the pay out;
5) The issue of assured railway performance; and
6) The desirability of a contribution to constant costs which varies with producers' ability to pay.

Although the GTA did not recommend on the mechanics of the pay out alternative, there was discussion of its implications in terms of basic economic, equity and administrative criteria. Like the GTR approach, the pay out would meet the test of resource neutrality, ending the bias against domestic use and processing of grain that arose because of a transportation subsidy that was available only for export movement of grain by rail. However, no analytical work was done by the GTA on the actual economic impacts of the pay out on livestock, milling or other domestic uses of grain.

All of the above proposals had a variety of equity, administrative, risk and political constraints making their adoption problematic. These constraints have been concisely spelled out in Mr. Justice Gordon Hall's report or, in the case of the GTA's report, are implied in the terms of reference to be assigned to the pay out task force.

Notwithstanding these constraints, the long, intense debate on method of payment issues has sharpened the definition of what is required in an ideal approach. The criteria for evaluating method of payment options have been summarized in the GTA's 1986 report.

Resource Neutrality - "requires that the method of payment not interfere unnecessarily with market forces and producer choice in determining production and marketing patterns in agriculture."

Equity - "requires that the method of payment take into account all losses and/or benefits arising from this change in public policy, and that it provide compensation for losses in a way that will be perceived to be generally fair."

Efficiency - "requires that the method of payment encourage the efficient use and development of the grain handling and transportation systems, and of agricultural resources."

Administrative Feasibility - "requires that the method of payment be capable of being administered without excessive complexity or costs."

Appendix 2: GRAIN PRICING

Over the course of Canadian grain marketing history, several marketing systems have been tried but only two have survived the test of time; the open market system and the Canadian Wheat Board system. The open market system supports a competitive environment and visible price determination, whereas the Board, as a monopoly seller, is designed to provide enhanced selling powers, increased equity through price pooling and a mechanism to conclude sales agreements with government buyers and large organizations in export markets. Although these basic differences in function exist , the systems are complementary to each other in their efforts to provide a total marketing operation. They function separately due to the advantages each can provide in either marketing situation.

The Open Market System

The major companies or institutions which play a role in the open marketing system include the primary and terminal elevator companies, domestic and export merchants, and the Winnipeg Commodity Exchange (WCE). The grain companies and merchants are referred to as the private trade. They act as principals or agents of others under competitive conditions. It is through this system that non-board grains including farm-to-farm transactions and 'off-board' local sales of grain are marketed, although many farm-to-farm sales are concluded directly between grain producers and consumers. No one participant in these markets can influence supply, demand or price. The primary elevators provide the producer with cash markets or storage. Domestic or export merchants facilitate the distribution of grain to export markets or to the plants of the processors.

The WCE is an unincorporated, non-profit institution for the grain trade. It provides an open market trading system characterized by open outcry competition to buy and sell cash grain and grain futures contracts. This system produces visible grain prices and a means to manage risk in volatile commodity markets. Prices of non-board grains to producers at primary elevators reflect the flat price based upon WCE futures less elevation, freight, storage, interest and related charges. Using the WCE value as a benchmark, the grain may then be resold to adjacent feedlots and processing plants or resold to B.C. feedlots and processing plants. Much

of the grain actually traded at the WCE is shipped to feed manufacturers and processors in Ontario, Quebec and the Maritimes by the domestic merchants.

The WCE operates futures markets for domestic Canola, feed wheat, feed oats, feed barley, flax and rye. Since producers have the choice of delivery to the Canadian Wheat Board or the open market for feed wheat and barley, only those deliveries sold to primary elevators are hedged in futures. The private trade also has full responsibility for non-board grains, rye, flaxseed and Canola.

Producers have the choice of delivering their grain to primary elevators, process elevators, interior terminal elevators or directly to feedmills, crushers, distillers, and feedlots. Prices at these locations will reflect WCE established values and local market conditions. One advantage of delivering to processors is that there are normally less restrictive delivery quota limitations.

The Canadian Wheat Board

The alternative marketing system to the open marketing system is the Canadian Wheat Board. The Board markets the major share of grain produced in Alberta. It has been the central selling agent for wheat, oats and barley for domestic food markets and the export market from the designated area (the three prairie provinces and the Peace River area of British Columbia). On August 1st, 1989 full responsibility for oat marketing will be formally assigned to the private trade. The Board, a Crown corporation, was incorporated under an Act of Parliament[12]. Fundamentally, the Board is responsible for the orderly marketing of western Canadian wheat and barley designated for human consumption and export markets. The selling policy of the Board is described as the sale and disposition of grain acquired by the Board pursuant to its operations under the CWB Act for such prices as it considers reasonable to promote the sales of grain produced in western Canada to the world markets[13].

The Board attempts to market as much grain as possible at the best price, provide prairie grain producers with price stability and ensure an equitable distribution of marketings to each producer. These functions include[14]:

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12 The Canadian Wheat Board Act, October 19, 1987.

13 Wilson, Charles F. *Grain Marketing in Canada*. 1979. Canadian International Grains Institute. Winnipeg, Manitoba.

14 Harvey, D. R. *Government Intervention and Regulation in the Canadian Grains Industry*. Technical Report E/I 6. Economic Council of Canada. June 1981.

1. establishing export selling prices, negotiating export contracts and developing the export market;
2. controlling deliveries of grain from farms to the CWB through a quota system. (Quota is used to ensure equity of access, control of inventories and grain scheduling within the year, and control of carryover stock levels between years. In recent years, the Board has also experimented with contracting systems, particularly for Barley.);
3. the allocation of rail cars to train runs;
4. the operation of pool accounts;
5. the negotiation of shipping and lake freight charges and elevator handling charges subject to maximum rates established by the Canadian Grain Commission; and
6. acting as a source of analysis and advice on behalf of grain producers with the federal government.

The Price Pooling Mechanism

The price pooling mechanism in use by the CWB is the system by which sales opportunities and sales revenues are pooled, and the infrastructure constraints and costs incurred by the CWB are shared[15]. This mechanism is established to ensure that market risk is shared equitably among grain producers. Pools are established for each type and grade of grain, consisting of quantities delivered by farmers during the crop year. The federal government , upon consideration of CWB recommendations, sets the initial payment for base grades within each pool. The CWB establishes price spreads between grades. The initial payment is a federally guaranteed floor price available from the pool account upon delivery of grain to a licensed elevator. Sales staff from the Board use information from the world markets and judgement to set the asking price. In addition to published commodity exchange values, factors which are considered in pricing decisions include tenders held by buyers, foreign currency exchange rates, freight rates, supplies, crop conditions and demand. The producer portion of costs associated with freight from primary to terminal elevator and primary and terminal elevator handling charges are deducted from initial payment. The value of grain in each pool account is determined at the end of the marketing year when all sales revenues are totalled and adjustments for marketing costs are made. The marketing costs include interest, insurance, storage, terminal elevator handling charges and CWB operating costs. Final payment is then distributed to all producers.

15 Dunlop, Diane. *The Impact of Grain Price Pooling on Producer Returns and System Costs.* University of Alberta. Unpublished Thesis. Spring, 1989.

Criticisms of the price pooling system have included[16] :

1. Increase of incentives to deliver all export grain after harvest due to lack of differentiation of prices over the marketing year;
2. Delivery quota which are, in part, designed to overcome the lack of differentiated price signals to induce timely delivery may have repercussions on sales to off-board market. Low quotas trigger lower off-board prices;
3. Changes in mix of output may result, particularly increases in production of non-board grains such as oilseed and specialty crops where quota is less restrictive;
4. The premium likely achieved by the Board on West Coast exports is not passed back to producers supplying the West Coast ports; and
5. The price pooling mechanism does not provide as much market based information to producers as the open market.

Grain Policy and Pricing Considerations

The Canadian Grain Commission is a government agency established to maintain grain quality and regulate grain handling. Its responsibilities include establishing grades and standards of grain, licensing and supervision of elevators, setting maximum tariffs, and providing a centre (the Grain Research Laboratory) for basic and applied research on grain and oilseed quality, while the Commission is not directly involved in purchase or sale of grain, grain companies are subject to its regulatory authority.

Government assistance to grain marketing has included programs for research and development. The Rapeseed Utilization Assistance Program was set in place in 1968 for the market expansion and improved manufacturing of rapeseed products. The Grains and Oilseeds Marketing Program in 1972 was similarly developed to sustain market expansion. In 1977, the Protein, Oil and Starch Plant was opened in Saskatchewan.

In 1969, the Canadian Grain Council was incorporated. Members included 30 organizations including representatives from producers, grain-handling, merchandising companies, transportation companies and industry associations. The Council also received federal and provincial government support. The purpose of the Council was to arrive at a consensus on problems within the industry and to present their views to government.

The greatest amount of government intervention has occurred in the feed grain policy area. Prior to the 1970's, feed grain marketing experienced

16 Harvey..Ibid...

little change[17]. The CWB was the sole seller outside the designated area and controlled all interprovincial sales within the designated area. Domestic feed grain was priced in relation to export prices. Differences in grain prices arose between the Prairies and the rest of Canada resulting in the establishment of the Livestock Feed Board of Canada in 1966. This board was responsible for the administration of a feed freight assistance program and the monitoring of supplies of feed grains. It also became an advocacy group for feed users outside the designated area.

This highly administered price system did not completely alleviate discontent with the feed grain marketing system. The price differential between the Prairie provinces and CWB outside the designated area continued to widen. The following factors contributed to the dissatisfaction:[18].

1. widespread belief that the CWB did not aggressively pursue sales of barley;
2. an increase of on-farm inventories of barley in the Prairies; and
3. cash flow problems for barley producers which resulted in distress sales and illegal, 'bootleg' sales of barley across interprovincial borders.

As a consequence, emphasis on barley production declined, and farm management skills were redirected to alternative crops. The federal government reacted by introducing an interim feed grain policy in October, 1973. This policy included the sale of Prairie feed grain to purchasers outside the designated area at Prairie price plus marketing costs less feed freight assistance. It substantially deregulated trade in feed grain within the Prairie provinces, and set a minimum off-board price for Prairie producers. Although the policy was a step in the right direction, it failed due to lack of arbitrage with international markets.

In August of 1974, the Domestic Feed Grain Policy was announced. The objectives of the policy included:

"- to provide a fair and equitable base price for feed grain across Canada...
- to provide relief for the producers against depressed feed grain prices...

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17 This section draws heavily on a report from the government of Alberta to the Canadian Wheat Board regarding the feed grain policy.

18 Hickson, A.B. and C.A. Carter. *An Analysis of Policy Change in the Canadian Feed Grain Market.* Western Journal of Agricultural Economics, 12(2):126-134.

- to encourage the growth of the livestock and feed grains across Canada according to natural factors and natural potential of various regions of Canada."[19]

Under this policy, the prices for wheat , oats and barley for domestic feed use were established on the Winnipeg Commodity Exchange. This led to a reduction in the role of the CWB in the domestic market. The CWB remained responsible for export and domestic feed grain sales and offered feed grain into the domestic market at prices related to prevailing US corn prices. Although no quotas were applied to deliveries for domestic feed use, feed grain space allocation in primary elevators was limited to 10% of the system capacity and 20% of the capacity of any one elevator. In the early 1980's, space allocation was replaced by a system of off-board feed grain quotas administered by the CWB. Hickson and Carter demonstrated that the institutional change of implementing the domestic feed grain policy yielded substantial benefits to Canadian Prairie barley growers and livestock producers. [20]

Modifications to the domestic feed grain policy were made in the 1976/77 crop year in three areas: the corn competitive pricing formula, the feed freight assistance and the reserve stock program. In August, 1976, the corn competitive formula was introduced to ensure that feed grain prices bore a competitive relationship to US corn prices. The formula valued domestic feed grains relative to their use in rations and adjusted according to changes in the soybean meal/corn price ratio. This formula seldom proved accurate[21].

The Feed Freight Assistance was reduced in British Columbia, Quebec and Ontario and replaced by grants for storage construction and for on farm handling and processing. The reserve stock program was developed to provide security of supply of feed grain to users. However, restrictions and charges were imposed by CWB on switches between primary elevators. Quotas on delivery of domestic feed grain were re-introduced by 1979.

Lack of arbitrage with world markets was a serious impediment to competitiveness in the feed grain sector. In 1982, the corn formula price was less than the export price. CWB asked for and received compensation from the federal government. Feed grain users recognized that the policy gave rise to notable inefficiencies in land use, grain pricing and grain movements and the western livestock industry suffered. In 1984, the CWB decided to no longer offer feed grain to domestic users, leaving the

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19 Canadian Grains council. *Domestic Feed Grain Policy Study*. A Report of the Advisory Committee. October, 1979, pp.23.

20 Hickson, A.B. and C.A. Carter.; Ibid...

21 Government of Alberta: Ibid.

responsibility to the open market. The corn formula was dropped as a feature of domestic feed grain pricing in August, 1985.

Mr. Justice Gordon Hall's Inquiry recommended that federal Crow benefits be paid directly to producers. Consistent with these recommendations, the Alberta Feed Grain Market Adjustment Program was designed in September, 1985. The program pays a Crow benefit on feed grain transactions where grain is used for livestock consumption within Alberta . Its purpose was to off-set the negative effects of the existing grain transportation legislation. This program initially compensated livestock producers by $21 per tonne of feed grain used. This compensation rate proved to be greater than the freight distortion created by the market.[22]. Due to fiscal constraints and the actual level of market distortion, the compensation amount was adjusted down to $13 per tonne in September 1986,under a program referred to as the Alberta Crow Benefit Offset Program (ACBOP). The compensation rate will be further reduced to $10.00 per tonne by September 1, 1989.

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22 Preliminary results from research currently underway by the Planning Secretariat of Alberta Agriculture demonstrate that the compensation rate to producers exceeded the freight adjustment. Current distortions between the status quo transportation system and producer share of benefits are estimated at $10.52/tonne.

Appendix 3: Element and Product Identification of Processing Chains

Wheat Chain

- **Wheat production** in Alberta has averaged about 5.5 million tonnes between 1978 and 1988. Three main classes of wheat are produced in Alberta and each is used for the production of specialized consumer products. The major class of wheat is spring wheat (other than durum) which is the traditional high quality bread wheat produced on the Canadian prairies. Spring wheat production between 1978 and 1988 has averaged 4.8 million tonnes. Durum wheat is used for pasta products. Between 1978 and 1988 durum production averaged 401,000 tonnes. Durum is concentrated in the south central and south eastern region of the province. Winter wheat is produced in the southern parts of the province. Between 1978 and 1988 winter wheat production averaged 281,000 tonnes.

Flour millers in Alberta include:

a. **Maple Leaf Mills Limited** operates a plant in Calgary with a milling capacity of 12,000 tonnes/day. Maple Leaf Mills Ltd. is owned by Hillsdown Holdings P.C.L. of England. The plant produces flour, bread mixes, cake mixes and donut mixes. Its brands include *Purity*, *Monarch*, *Red River* and *Jolly Miller*.

b. **Ogilvie Mills Limited** operates a plant at Medicine Hat, Alberta with a milling capacity of 7,600 tonnes/day. Ogilvie Mills Limited is owned by John Labatt Limited of London, Ontario. The plant produces flour, cake mixes, pastry flours, whole wheat flours and animal feeds. Its brands include *Five Roses*, *Meota*, *Primrose* and *Glenora*.

c. **Byers Flour Mills Limited** operates a plant at Camrose. It is a smaller, family owned operation with a capacity of 480 tonnes/day producing flour, hot cereals and pancake flour. Brands include *Sunshine*, *Sunny Bay*, *Rosebud* and *Golden Loaf*.

d. **Ellison Milling Company** operates a mill at Lethbridge with a capacity of 3,900 tonnes/day. Ellison Milling Co. is owned by Parrish and Hiembecker of Winnipeg. The mill produces bread flour, cake flour, durum flour and feed ingredients. Brands include *Ellison's* and *Royal*.

e. **Rockport Flour Mills Incorporated** operates a plant at Magrath. This family owned plant produces waffle and pancake mixes, white flour and wholewheat flour. Its brand name is *Coyote*.

f. **Sun Prairie Mills Limited** operates a mill at Nanton. The primary product is whole grain flours. The brand name is *Sun Prairie*.

g. **Westglen Milling Corporation** operates a mill at Barrhead. Products include Stoneground Flour, Pot and Pearl Barley, Rye Flour and Bird Seed. Brands include *Doc's Best* and *Westglen*.

- **Screenings and Millfeeds** are byproducts of the flour milling process. This includes the product of processes to clean the wheat prior to milling and also the 25% of the wheat grain that is not processed into flour. This includes brans, shorts, middlings and fine fibrous material. The primary market for byproducts from flour milling is the livestock feed market. The market is almost entirely provincial, consisting of Alberta's many livestock feed manufacturers.

- **Flours and flour mixes** are the primary product from wheat milling operations. Commercial grades of flour include household flour, commercial baker's flour and low grade flour for industrial purposes. Durum flour is sometimes called semolina. Other mixes are made by blending flour types (eg. hard red spring, hard red winters , or soft white wheat spring varieties) to achieve desired baking characteristics. Flour sales are generally limited to domestic markets. The only flour exported from western Canada is as a result of federal government food aid programs.

- **Feed Manufactures** produce livestock and pet feed products almost entirely for the Alberta market. They are covered in a separate section of this report.

- **Bakeries and Pasta makers** are represented by 33 bakery and 14 pasta makers listed in the Directory of Alberta's Agricultural Processing Industry. These firms range from large establishments like Weston Bakeries Limited with over 100 employees specializing in bread production for the local market to small operations like the Wing On Chinese Noodle Factory.

- **Products incorporating flour** are the next stage in the chain. The variety of products is enormous, ranging from breads, donuts and pastas produced for the local market to cookies and crackers which are consumed both locally and in the export market.

Canola Chain

- **Canola Seed Production** in Alberta has averaged about 1.3 million tonnes between 1978 and 1988. Canola production is concentrated in the Parklands region of the Province, where temperature and moisture conditions are more appropriate to the plant's physiology. Major markets are domestic crushers primarily in western Canada but also in Ontario, Japan, Mexico and the U.S.

- **Canola Crushers** in Alberta are:

  a) **United Oilseed Products Incorporated** operates a plant at Lloydminister with a crushing capacity of about 720 tonnes/day. United Oilseeds is a joint venture owned by United Grain Growers, Nisshin Oil Mills and Mitsubishi Corporation. The plant produces Canola oil (unrefined), meal and screenings.

  b) **Canbra Foods Limited** operated a plant at Lethbridge with a crushing capacity of about 730 tonnes/day. Canbra is now owned by Pocklington Financial Corporation. The plant can produce Canola Oil (refined), meal, shortenings, margarine and screenings. The facility is currently being expanded.

  c) **Alberta Food Products** operates plants in Fort Saskatchewan and Wainwright. The plant is owned by Canada Packers Limited. The plants produce Canola oil (unrefined and refined), meal and screenings.

d) **Alberta Terminals Canola Crushers Limited** operates a plant at Sexsmith with a crushing capacity of 630 tonnes/day. The plant produces Canola oil (unrefined), meal and screenings.

- **Canola meal** is the material left over after oil extraction. Its composition is illustrated in the following table.

Table 1
Dry Matter Composition of Canola Meal

Dry Matter Composition	With Hull	Without Hull
Crude protein (%)	39.2	52.0
Fat (%)	2.8	2.7
Fibre (%)	12.5	5.5
Energy (TME kcal/kg)	2,555	3,484

Canola meal is used in cattle, hog and poultry rations.

- **Unrefined oil** is the product of primary processing activities. Canola seed is conditioned, processed and a solvent is used to extract crude oil. The resulting crude oil is then degummed before storage or secondary processing. Crude oil is not suitable for human consumption. Gum fractions are fed back into the meal and become part of the product sold to feed manufacturers. Major markets for unrefined oil are domestic refiners and U.S. processors. Two products involved in the process are crude oil and meal.

- **Feed manufacturers** utilize Canola meal in feed formulations designed for a wide range of livestock applications.

- **Canola oil refiners** in Alberta include Canbra Foods Limited and Alberta Food Products.

- **Livestock feed products** incorporating Canola Meal include rations for cattle, calves, hogs, weanling pigs, baby pigs, and poultry. Sales of feed rations are almost entirely local within a 50 mile radius of each plant. Exports are negligible.

- **Canola oil** is the refined product yielding as edible oil product. The steps in refining include: 1) refining, 2) bleaching, 3) hydrogeneration, 4) formulation, 5) deodorizing, 6) final formulation, 7) packaging, 8) winterizing, and 9) interestification.

Refined Canola oil has properties which make it a superior food product. Its principal markets are domestic: in 1988, Canola oil accounted for 83% of the salad and cooking oil market. Increasingly, the U.S is becoming a major export market. In recent years, large oil sales have been made to India on CIDA food and development aid programs.

- **Other processing** for retail sales includes the integrated companies capable of making products such as margarines and shortenings. In Alberta these companies include Prairie Margarine Inc. (owned jointly by Canada Packers and CSP Foods), Canbra Foods Ltd. and Canada Packers Inc. at Wainwright.

- **Shortening and margarine** is made from refined Canola oil. Canola currently holds a 42% share of the Canadian margarine market and 57% of the shortening market. In the future, there is considerable potential for these products in the U.S. market as their current market share is very small.

i. Red Meat Related Industries

The red meat enterprises examined in this study were those involved in cattle, swine and sheep/lamb production. The following tables indicate yearly production and stock level numbers for these industries[23] .

[23] Data provided courtesy of Statistics Branch, Alberta Agriculture.

Table 2

Alberta Livestock on Farms, July 1 (thousand head)

	Hogs	Sheep/lambs	All Cattle	Calves	Beef Cows/Heifers
1977	944.3	146.5	4350	1315	2078
1978	960	142.5	4135	1239	1960
1979	1130	153.5	4080	1205	1925
1980	1251	178	4155	1290	1951
1981	1185	198	4153	1300	1936
1982	1180	203	4080	1260	1941
1983	1255	202	3965	1235	1905
1984	1470	188	3975	1255	1899
1985	1475	175	3840	1245	1831
1986	1508	183	3746	1252	1802
1987	1670	194	3860	1280	1837
1988	1735	198	4015	1340	1919

Table 3

Alberta Red Meat Production (millions of lbs)

	Pork	Mutton & lamb	Beef	Veal	Total
1977	153.5	2	893	7.3	1,055.9
1978	158.8	1.5	794.7	3.3	958.4
1979	192.1	1.5	756.7	.7	951.0
1980	235.6	1.7	749.1	.7	987.2
1981	231.2	2.5	770.3	1.5	1,005.6
1982	214.8	3.6	772.5	1.3	992.2
1983	220.2	4.4	795.2	.9	1,020.8
1984	209.3	5.4	754.4	1.1	970.1
1985	233.8	4.4	778.4	1.2	1,017.8
1986	209.4	4.1	702.3	1.3	917.0
1987	241.3	3.5	728.1	1.2	974.1
1988	218	3.8	793.8	1.2	1,016.8

- **Cattle/calf production**

The average inventory of cattle on farms as of July 1st for the period 1977 to 1988 was 4029.5 thousand head. This data demonstrates a significant downward trend over time, from the high of 4350 thousand head in 1977 to a low of 3746 thousand head in 1986. A similar trend was also evident in livestock slaughtering numbers at federally inspected establishments for the same period. The average number of cattle slaughtered during this period was 1,294,297 head. The greatest number of head (1,590,184) were slaughtered in 1977, declining to 1,142,241 head in 1986. The average cold carcass weight of cattle for the same period was 599.2 lbs. Carcass weight did, however, show a significant positive trend over time.

As of July 1st, 1988, 1,919,000 head of beef cows and heifers were reported in the province. The total cattle population was 4,015,000 head. Inspected slaughterings for that year were 1,226,589 cattle and 6,326 calves. Red meat production (cold carcass basis) was 793.8 million lbs of beef and 1.2 million lbs of veal. Exports of live cattle for 1988 were 229,142 hd., down 28% from 1987(318,339 hd). In 1987, Alberta imported 330,338 hd. live animals, 2% from U.S., 31% from B.C. and 67% from Saskatchewan.

Beef production in Alberta involves a number of types of enterprises; feeder, stocker,or slaughter cattle. Typically, feeder operations produce calves weaned between 400 to 600 pounds. Stocker operations keep calves over winter and sell in spring at a weight of 600 to 900 pounds. In slaughter cattle production, calves are fed a combination of grain and silage or hay for 230 to 250 days, and yearlings are fed rations with greater grain content for a period of 90 to 120 days.

Based on a study conducted on 34,564 cattle[24], production summary data indicated that yearling steers gained 171 kg over an average of 115 days. Steer diets contained a constant level of barley (86.1% dry basis).

- **Hog Production**

As of July 1st, 1988, 1,735,000 hogs were reported on farms in Alberta. A significant positive trend was evident during the period 1977 to 1988 (coefficient of determination of .938). Slaughterings for 1988 were 1,563774 head, with 218 million lbs of meat production and a carcass weight of 139.4 lbs. A significant increase in slaughter numbers during the 1977 to 1988 period was evident, however the relationship was not as strong as with the livestock on farm numbers (coefficient of determination of.36).

Alberta is a net exporter of live hogs. Exports in 1988 were 436,533 head, up 67% over 1987 (261,373 hd). Imports of live hogs were only 3187 kg in 1987, 41% from B.C. and 59% from Manitoba.

Analysis of impact of the Crow change on the swine industry is based on the grain content of various feed rations

[24] Lakeside Research and L.A. Malmberg. Ibid...

and feed usage per 100 kg based on production records from 4500 market hogs[25].

- **Sheep/lamb production**

  Livestock numbers for sheep and lambs on July 1st, 1988 were 198,000 head. Slaughter numbers for 1988 were 76,326 head. Meat production for this year was 3.8 million lbs, with an average cold carcass weight of 50.2 lbs. In 1987, the number of live exports out-of-province were 14,080 head while imports were 19181 head, 83.5% from U.S., 12% from B.C. and 4.5% from Saskatchewan.

- **National Tripartite Stabilization Program:**
  Support prices are calculated as the national cash costs plus a proportion (95% for hogs and 85% for cattle) of the difference between the national average price and a 5 year national average cash cost for the same period (monthly for cattle and quarterly for hogs). Payouts are triggered when the market price falls below the support level price and are equal to the difference between the support price and the national weighted average price.

  The following table is a summary of payout for the red meat programs for the fourth quarter, 1988:

Table 4
National Tripartite Stabilization Program Payout Summary for Fourth Quarter, 1988

	Hogs	Slaughter Cattle	Lambs
National support price	$168.8/ckg	$85.99/cwt	$88.91/head
National avg. selling price	$122.11/ckg	$78.46/cwt	$76.32/head
Payment-basis	$46.69/ckg	$7.53/cwt	$12.59/head
Unit of weight	79.4 kg	1168 lbs	100 lbs
Payout per head	$37.08	$87.92	$12.59
Alberta price input	$107.7/ckg	$82.00	$62.76

The calculations of national cash costs in the slaughter model are based on a western and eastern scenario of costs which include costs such as the purchase cost of feeders, feed, interest, trucking and selling costs. This national cash cost is weighted by regional slaughter volume; approximately 60% western (Alberta, B.C., Saskatchewan and Manitoba) and 40% eastern (Ontario, Quebec and the Atlantic provinces). Alberta historically markets approximately 41% of total Canadian slaughter cattle. Slaughter

25 Ibid....

weightings are also adjusted for Alberta cattle exports to U.S. and imports of slaughter cattle by Ontario. The impact of a change in method of payment will be based on an Alberta only assumption. Monthly support prices are calculated as the cash cost for the month plus 85% of the difference between average price and 5 year average monthly costs (guaranteed margin approach). An average cash cost reduction in Alberta steer production of $7.70 should result in a reduction in support level of approximately $3/head or 26¢/cwt. Review of past support levels for the period 1978 to 1988 indicate that all payouts would still occur in the respective months, although total payout would be reduced by approximately 2%. NTSP levy calculations are base on a levy rate (2.481%) times the estimated value per head divided by the three way split. Premium required per head is calculated as:

2.481% x [estimated value/head=$84/cwt x 11.50cwt/steer] ÷ 3= $7.98.

The average savings of .8% in steer cost would translate into approximately 4¢ savings/head in premium (.5% saving in premium).

In the hog model, Alberta volume of slaughter would account for only approximately 12% of the Canadian total slaughter number. An average feed cost reduction of $2.90 per hog would represent at most a national cash cost reduction of $.35/hog or 16¢/cwt. Effect on premium reduction would again be marginal.

•. Supply Managed Industries

Supply managed industries require special consideration because:

a) they are limited in their ability to take advantage of economies of scale, not primarily by economic factors but by regulatory factors; and
b) export markets for these products are limited.

i. Dairy

Dairy production is under the control of a national supply management system. The market is divided into fluid and industrial milk. Fluid milk is controlled by the provinces and there is little interprovincial movement. Industrial milk is under federal jurisdiction for quota and price setting.

- **Fluid Milk**

Fluid milk prices are set by the Public Utility Board. Seven factors are included in the cost formula for fluid milk pricing in Alberta (as detailed in Table 5):

Table 5
Components and Weightings in the Alberta Fluid Milk Pricing Formula

Component:	% of total cost	Aug. 1989 rate:
The Producer factors--		
1. dairy ration (76% grain)	14	$201.87/t
2. hay price	14	$69.54/t
3. other farm input index	20	112.8
4. farm wage index	12	132.4
5. Consumer Price Index	10	151.3
The other factors--		
6. weekly industrial wage	16	478.68
7. milk consumption	14	9.09

Milk consumption has remained fairly constant by province and over time. Alberta reportedly has the lowest cost of milk in Canada. Adjustments for the Alberta Crow Benefit Offset Program have been incorporated into the model. The August total is compared to the base period (August, 1973) for price calculation. The August calculated price was $52.63/hL. The actual price was $52.05/hL. A price difference of 49¢/hL between actual and calculated prices is required to trigger a price change. The new proposed price for the PUB is $53.03. The last change occurred on Aug. 1,1989. Contributions to total change may be attributed as follows; 29% to an increase in hay feed, 12% in both farm wages and consumer price index, 9% from other farm inputs, 21% from weekly industrial wage, 3% from milk consumption, and 15% from a decrease in dairy ration. Note that all components in the pricing formula rose in value, with the exception dairy ration cost.

Products of fluid milk include standard milk, low-fat milk, cream and skim-off cream. Processing of fluid milk requires pasteurization and homogenization.

- Industrial Milk

Alberta currently has 6.7% of the national MSQ quota. Prices are set with a cost of production formula, however the sample in the cost of production survey are entirely from Ontario, Quebec and New Brunswick. This C.O.P. is based on a total farm approach

where feed costs account for only 12% of total cost of $47.07/hL. The total cost becomes the target price.

Products of industrial milk include butter, skim milk powder, whole-milk cheese, ice cream mix, evaporated milk and products such as yogurt, cottage cheese, etc. Processing of industrial milk requires condensing, dehydration, cheesemaking and ice cream equipment for the various products.

Current PUB wholesale prices for milk are:

	$/L	% saving/milk price
Homo	.85	.98
2% Skim	.83	1.0
1% Skim	.81	1.02
Skim	.79	1.05
Chocolate	.91	.91
10% cream	1.69	.49
Whipping cream	3.68	.23

Retail prices are set at 7¢/L above wholesale prices, except for cream; $1.83/L for 10% cream and $3.97/L for whipping cream.

ii. Poultry

The poultry industry in Alberta primarily supplies the local market. The industry is characterized by high transportation, labor, and housing costs and relatively small enterprises as compared to production units in other countries. Quotas also limit entrants and quantity produced.

Feed is the key input in the poultry industry. Feed sources must be located near to production. Profitability is dependent on feed conversion and costs. Under supply management, poultry meat and egg producers have a guaranteed market for their product. Prices of the product generally are set at levels which cover production costs and provide some return for management.

In 1988, the total value of poultry production was approximately $140 million, 2/3 of this total resulting from poultry meat production and 1/3 from egg production.

- **Eggs**

Commercial egg producers in Alberta are part of the Canadian Egg Marketing Agency (CEMA). CEMA sets the provincial quotas and price. Eggs are priced according to a national cost of production study (the last survey was conducted for 1986). The study is based on farms containing 8-50,000 birds. The average farm size in Alberta for the 234 registered producers is 6,000 birds The provincial quota is just over 1.5 million birds. Alberta produced approximately 89% of its base quota, and imports 25-30% of provincial egg requirements from other provinces. Manitoba and Saskatchewan are the primary surplus provinces. Price decreases the further the distance from these provinces. In 1987, Alberta imported 11,469,795 dozen eggs, 83% from Saskatchewan and the remainder from Manitoba.

The 1987 Alberta Cost of Production Study indicates that return to equity for egg producers was approximately 14%. Feed costs ($168/t for ration) represented 43% of total cost. Along with the C.O.P. formula pricing, a transportation differential or levy of 16¢/dozen for egg disposal is applied.

Eggs are marketed through grading stations, although producers may market ungraded eggs directly to consumers.

- **Broiler**

The Alberta Broiler Growers' Marketing Board allocates quota by space (1 bird/sq.ft.) for broiler chicken, roaster chicken and small plant growers. The allocated quota for 1988 was 4,400,000 sq. ft. of quota space to 252 registered broiler growers for a nine week cycle. When the market requires, the board also issues new quota on a 35% to new growers and 65% to existing grower basis. Processors are issued permits by the Board to arrange with producers to grow Cornish.

The Canadian Chicken Marketing Agency allocates national quota. In 1987, Alberta was allocated 42,000,000 kg. or 8.2% of the total quota. Each provincial board establishes its own prices for chicken and turkeys. Most provinces respond to the nearest surplus producing province (Manitoba).

The two main processors in broiler production include Lillydale Co-op which operates hatcheries and killing plants in Lethbridge,

Calgary and Edmonton, and Canada Packers which operates a hatchery at Wetaskiwin and a killing plant in Edmonton.

The following represent some benchmarks used by the broiler industry:

	Average
Feed conversion	2.00kg feed/kg gain
Weight-kg	1.8kg/bird

- **Turkey Production**

In 1987 Alberta was allocated 9,699,000 Kg or 8.73% of national quota. Each provincial board sets its own price for turkey. Alberta sets its price to be competitive with Manitoba, which is a surplus province.

Average exports for meat and products for the previous 5 year period were:

Beef	27259 tonnes
Pork	24812 tonnes
Lamb	7.4 tonnes
Poultry	21.6 tonnes
Prepared meats	2586 tonnes

Slaughter procedures generally include stunning(electrical or CO_2), sticking (bleeding), dehairing (scalding or removal of hide), evisceration, grading, chilling, cutting and ageing. Procedures for processing depend on the final product and may include tenderization, curing, sectioning and forming.

- **Meat Packing/Processing**

In 1980, four of the largest enterprises controlled 43.3% of the sales for the industry. Two major product categories can be identified for pork and beef. In beef, 30% is sold as ground meat, and almost 70% is sold as fresh cuts. Only a small portion is used in processed meats. In pork production, 65% is consumed as processed pork products and 35% as fresh pork cuts. Processed pork products are marketed under brand names associated with specific packers.

Yield on beef is about 58.5%, 69% of which is retail beef and 31% is other products (bone, fat, suet). Yield on hogs is about

75%, with 77% retail and 23% other products. By-products (hides, offal and tankage) are therefore important.

In 1987, 324 tonnes of meat were shipped out-of-province; 72.5% of which was beef and veal, 22.5% was pork and about 5% was other meats.

The largest national firm in the industry is Canada Packers which operates plants in Red Deer, Calgary, Lethbridge, Moose Jaw, Winnipeg, Toronto, Montreal and Charlottetown. The Calgary plant processes beef and boxed beef. Lethbridge and Red Deer are specialized plants shipping carcass beef. The second and third major national firms consist of Burns/Canadian Dressed Meats and Gainers, respectively. Brand names used by Gainers include Gainers, Swift, Premium, Superior, Sugar Plum, Lazy Maple, and Captains Cabin. Fletchers, a regional firm, has plants in Red Deer and Vancouver and uses the brand name Fletchers'. Fletchers exclusively kills and ships fresh cuts of pork. Single-plant firms include Dvorkin, Lakeside Centennial Packers Ltd. and XL in Alberta. Cargill Limited has a new, integrated slaughter fabrication plant now coming on stream in High River.

The series of manufacturing operations involved in beef processing provides intermediate products of carcass, boxed beef, boneless beef and final products of fresh beef cuts or ground beef. Pork processing generates intermediate products of pork carcass and primal cuts and final products of fresh pork cuts and processed pork products.

Estimated 1989 weekly slaughter capacity for beef at federally inspected beef packing plants in Alberta is summarized on Table 6:

Table 6

Federally Inspected Beef Packing Plants in Alberta and Estimated Weekly Slaughter Capacity 1989[26]

Plant	Location	Weekly Capacity
Canada Packers Inc.	Lethbridge	3,700
Canada Packers Inc.	Red Deer	3,500
Burns/Canadian Dressed Meat	Lethbridge	2,500
XL Foods Ltd.	Calgary	6,000
Lakeside Packers Ltd.	Brooks	6,000
Beef & Cattle Co.(Dvorkin)	Calgary	3,500
Gainers Inc.	Edmonton	3,500
Cargill Foods Ltd.	High River	6,000

Poultry processing is primarily handled by Canada Packers Limited and Lilydale in Edmonton, Pinecrest Poultry Sales Limited in Calgary and Lilydale Co-operative Limited in Lethbridge. Smaller, less significant processing are done in Andrew, Beaumont, Hutterite colonies, Okotoks, St.Paul and Wanham.

The Lambco plant at Innisfail is a specialized packer of fresh lamb and veal with a capacity of 5000 head per week which kills the majority of the sheep and veal slaughtered in Alberta.

The following statistics are available for U.S. packers and processors[27] for 1986:

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26 Peat Marwick Consulting Group. *Preliminary Study on the Feasibility of a Federally Inspected Beef Packing Plant in the County of Beaver*. June, 1989.

27 Meat Facts, American Meat Institute. 1988 Edition. Packers are defined as companies that slaughter livestock and have sales primarily of fresh meat. Processors do not slaughter livestock and are primarily involved in the manufacture and sale of processed meats. Packer/processor companies are defined as companies that slaughter livestock and have sales of processed meats equivalent to 2/3 or more total sales.

Table 7
Meat Industry Sales Breakdown by Company Type

	Packers	Packer/ Processor	Processors	1987 Canada[28]
Total Sales	100.00	100.00	100.00	100.0
livestock/meat	82.01	60.69	64.40	
supplies & containers	2.92	7.42	6.67	
Production labor	4.22	5.89	5.33	
Cost of Goods sold	89.15	74.00	76.40	83.7
Gross Margin	10.85	26.00	23.60	16.3
Other wages	1.87	5.27	5.00	
Total Benefits	1.96	3.12	2.78	
Other expenses	5.86	12.96	12.27	
Total Expenses	98.84	95.35	96.45	
Earnings before tax	1.16	4.65	3.55	
Income Taxes	.61	2.15	1.12	
Net Earnings	.55	2.50	2.43	

Initial contact with meat packers/processors has provided the following comparisons:

Table 8
Alberta Meat Industry Sales Breakdown by Commodity Type for 1989

	Beef	Poultry	Lamb	Pork
Total Sales	100.00	100.0	100.00	100.0
livestock/meat	94.00	45.0	80.00	65.9
production labor	2.54	14.0	6.50	4.6
supplies & material	—	5.0	2.50	
Cost of Goods sold	96.54	64.0	89.00	
Gross Margin	3.46	36.0	11.00	
Frt. & other	2.50	31.2	12.90	
Net	.96	4.8	-1.90	

	Packer	Processor
Total Sales %	100.00	100.0
livestock/meat %	79.05	64.9
production labor %	3.80	7.3

28 Preliminary results, Statistics Canada. SIC 1011, Food Industries: Meat and Meat Products Industry.

Barley is principally used as feed for livestock. Higher grades of barley are used for malting and brewing in the manufacture of beer and for distilling in whisky manufacture. Barley as a feed source contains 34% fibre and is relatively indigestible. Total digestible nutrients in barley are given as 79%. High protein barley is more desirable for feeding purposes (high lysine). Production of barley in Alberta averaged 5.87 million tonnes over the last 5 years. In 1988 Alberta produced 5.8 million tonnes. Exports of barley over the 5 year period (1984 to 1988) averaged 1.8 million tonnes, valued at $198.8 million.

Oats is used mainly as feed for livestock. It is an important component in horse rations (70%), and is used to a lesser degree in other feed rations (primarily starter rations however the proportion will vary in relation to barley prices). Feed, waste and dockage of oats represents approximately 69.2% of total disposition in Canada over the last 10 year period. Alberta produces approximately 40% of all oats produced in Canada, and 50% of all oats produced in Western Canada. The average level of production of oats over the 1984 to 1988 period was 1.27 million tonnes. Average exports for the same period were approximately 123.9 thousand tonnes.

Of the total Canadian disposition of **wheat**, it is estimated that an average of 7.2% is attributed to feed, waste and dockage, whereas exports represent an average of 78.2% of Canadian production. Production of all wheat over the period 1984 to 1988 averaged 5.6 million tonnes in Alberta. Exports out-of province for this period averaged 4.2 million tonnes.

Coarse grains represent approximately 87.2% of total ingredients used by feed manufacturers in Canada for the period 1976 to 1984. Of the grains used, barley and corn contribute the greater portion, 31.9% and 36.2%, respectively. Wheat, oats and screenings represent 17.2%, 8.2% and 5.1%, respectively. The other major ingredients used by manufacturers in feed mills include bran,shorts and middlings (6.7%), chopped, crushed, and ground corn (2.1%), and malt sprouts, brewer and distiller solubles, etc. Feed and feed supplement imports into Alberta in 1987 were 213.7 thousand tonnes, valued at $70.6 million.

Feed Mills in Alberta

It is estimated that there are 80 establishments involved in the feed industry in Alberta. The larger primary feed mills include:

a. Cargill Nutrena Feeds in Camrose and Lethbridge, producing livestock feeds, pet foods, supplements and premixes under the brand names of Nutrena Feeds, Top Dairy, Top Beef, Top Hog and Top Dog.

b. Master Feeds has mills in Edmonton, Stettler and Calgary. It produces livestock feed and supplement.

c. New Life Feeds, Division of Ellison Milling, in Lethbridge, producing livestock feeds under the brand name of New Life Feeds.

d. United Feeds has mills in Lethbridge, Edmonton, Midnapore, Olds and Calgary, producing livestock feeds and supplements.

There are numerous smaller feed mills employing 1 to 25 employees each.

In 1986, the value of shipments of goods from feed mills in Alberta was $284,604 thousand. The value added from the feed industry was $60,250 thousand, or 21.17% of shipment value. Cost of materials and supplies was estimated to be $219,626 thousand, 77.17% of shipment value. Production labor represented 4.8% of total shipment value and cost of fuel and electricity represented 2.2% of shipment value. The Alberta industry in 1986 employed 628 people in the manufacturing activity.

Malt/Brewer/Distiller Chain

Of the total barley production in Canada over the 1978/79 to 1987/88 period (11,936,000 tonnes), only about 3.2% found its way to industrial use for malting, distilling and brewing. Disposition of **malt barley** in Canada for the period 1977 to 1986 consisted of 60.5% for domestic consumption and 38.1% for export. The majority of domestic consumption in Canada in 1988, 328,000 tonnes or 96.5% was used by the brewing

industry. Distilling and food industries consumed approximately 7,000 tonnes or 2.0% and 5,000 tonnes or 1.5% of Canadian domestic supply, respectively.

The required characteristics of barley for malting and brewing include high germination capacity, high energy, low husk content, low protein (1.35-1.75% nitrogen content) and high starch content. The barley should be free of broken or de-husked grain and be able to produce a maximum of extract when mashed.

The **malting process** is a germination process which produces enzymes that convert barley starch to fermentable sugars. Barley is steeped in water, germinated for a period of 8-12 days and dried to 2% moisture content. Rootlets are screened out (malt culm representing 3-5% of total material), and the screened product is malt. Yield of malt from barley is about 77.5%.

Alberta has but one malt processor, Canada Malting Co. Ltd. in Calgary. This plant has a capacity of 155,000 tonnes of malt and produces brewers malt, and distillers malt.

Brewing is the process whereby barley starch is converted to an alcoholic solution by means of yeast fermentation. The process involves grinding and steeping or mashing the malt product in hot water to gelatinize the starch and convert it to sugar. The extract (wort) is filtered, hops are added and the mixture is then boiled. This liquid is then filtered, seeded with yeast and allowed to ferment for several days. Yeast is removed and a second fermentation may proceed. About 75% of the original starch is converted to alcohol.

In Edmonton, two larger breweries, Labatt's Brewing Co. and Molson Alberta Brewery Ltd., employ over 100 employees each. Strathcona Brewing Co. Inc. is a smaller brewery in the Edmonton area.

Calgary has three breweries. Carling O'Keefe Breweries of Canada Ltd., is a large brewery which produces beer, light beer, malt liquor and draught beer under the brands of Old Vienna, Alta 3.9, O'Keefes Old Stock, Calgary Lager, and Foster's Draught. Two smaller breweries in the Calgary area include Big Rock Brewery Ltd. which produces ale, and Calgary Interbrew Ltd.

Drummond Brewing Company Ltd. in Red Deer, is a larger company (over 100 employees) producing bottled and draught beer.

Distilling operates under a similar process as brewing with the exception of the addition of hops. The extract is distilled to 140° proof. Malted barley is used in the process for making Scotch malt whiskies and some Canadian whisky.

There are currently three distilleries in Alberta, including:

a. Alberta Distillers Ltd. in Calgary, produces rye, vodka, gin, rum, whiskey under the brands of Windsor, Canadian Spirit, Alberta Springs, Carrington, Golden Crown, and Alberta Premium. This distiller is the largest in Alberta.

b. Palliser Distillers Ltd., in Lethbridge is the second largest distiller in Alberta, producing vodka, gin, rye, whisky and rum.

c. Highwood Distillers Ltd., in High River produces whisky, rum, vodka, and neutral spirit.

Beans, Peas and Protein

Most field **peas** grown in Canada are used for making soup. The preferred varieties are the yellow-seeded cultivars such as Century, Trapper, Tara, and Lenca. The green or blue pea variety grown in Alberta is Triumph. Crops are delivered to elevators where cleaning, grading and removal of trash occurs before shipping. About 50% of the Canadian crop is exported as whole peas and 25% as split peas. Remaining peas are used by domestic soup manufacturers and protein extraction plants and for seed. Processed peas are priced on the basis of maturity. Prices for peas are based on 'tenderometer' readings and are outlined in company contracts. The average 5 year production level of dried peas in Alberta was 43,266 tonnes. There has been a marked increase in production over the period, rising from 16,233 tonnes in 1984 to 111,633 tonnes in 1988.

Snow peas varieties, grown by contract as required by processors, include Giant Dwarf Sugar, Oregon Sugar Pod, and Dwarf Grey Sugar.

New products like protein concentrate and starch may be manufactured from pea flour for use in food enrichment and other industrial uses.

Dry **bean** varieties grown in Alberta include Pinto 111, Fiesta(pinto), Seafarer, Snowflake, Red Mexican 36, Garnet, Viva, Harold, Victor, and Great Northern 1140. Beans are graded according to federal standards and standards set by individual processors. Marketed beans averaged 8,945.9 tonnes over the last 5 years. Production increased over the period from 3081 tonnes in 1984 to 14,575 tonnes in 1987 and 14,285 tonnes in 1988.

Lentils, an annual legume which matures in 90-100 days, has high protein and is used primarily for human consumption, most commonly in soups and stews. Common varieties include Chilean, Eston and Laird. Yield is approximately 993 kg/ha. in Alberta. Lentils may be consumed whole, decorticated, split or ground into flour. There is little commercial processing of lentils. Although primarily a human food, they may on occasion be fed to animals. Straw, pod walls, and residues from threshing have a high feed value. The composition of lentils is about 10.2% moisture, 1.8% fat, 4.4% protein, 50% carbohydrates, 21.4% fibre, 12.2% ash. Lentils are occasionally grown as a fodder with the whole plants being grazed green or cut and fed to livestock. Yield of starch from seed is 28.5% and the residue (40% protein) is a valuable animal feed.

Crops are marketed to either grain companies or seed processors who are responsible for preparing the product for export. The major companies involved in seed processing include:

a. Alberta Wheat Pool, which operates two plants; one plant in Calgary for peas, beans, lentils, canary seed, cereal grains, and oilseeds and a plant in Bow Island which specializes in dry bean processing.

b. B.C. Pea Growers Ltd., which operates a peas and seed pea plant in Brooks. Brand names used by this company include Sunset Seed and Avion Pea Soup.

c. Chinridge Seed Processors Ltd. with a plant in Taber for caraway, coriander, safflower, canary seed, peas, and mustard seed.

d. Columbia Seed Co. Ltd. with a plant in Vauxhall, producing peas and seed peas under the brand name Columbia.

e. United Grain Growers Ltd. (Seed Division), has a plant in Edmonton for mustard seed, peas, legumes and oilseeds.

The major vegetable processor involved in canning of beans and peas is Empress Foods Ltd. in Lethbridge. Brand names used by this company include; Bel Air, Scotch Buy, Town House, Cragmont and Taste Tells. Most of the product is in frozen form for domestic consumption.